DOCUMENT RESUME

ED 241 301 SE 043 994

TITLE	National Workshop on Nutrition Education in Health Professions Schools (Washington, DC, September 30 - October 1, 1981).
INSTITUTION	Emory Univ., Atlanta, GA. School of Medicine.
SPONS AGENCY	Health Resources Administration (DHHS/PHS), Hyattsville, Md.
PUB DATE	81
CONTRACT	232-81-0015
NOTE	112p.
PUB TYPE	Collected Works - Conference Proceedings (021) -- Reports - Descriptive (141)
EDRS PRICE	MF01/PC05 Plus Postage.
DESCRIPTORS	*Curriculum Design; *Curriculum Development; Evaluation Methods; *Health Programs; Health Services; Higher Education; Medical Education; *Nutrition; *Nutrition Instruction; *Program Administration

ABSTRACT

This workshop was designed to provide opportunities for health professional schools to gain from an understanding of: (1) the major issues which face nutrition education; (2) promising practices in nutrition education from leaders in the field; (3) the need for nutrition education for all health professions; and (4) nutrition education curriculum design, evaluation strategies, and management practices which foster and improve nutrition education for health professions students. Included are reports on: nutrition priorities in education; the nutrition curriculum, scope, and sequence; role of the physician and dietitian in nutritional care; The American Medical Association perspective on nutrition education; issues in medical education; management of the nutrition curriculum; evaluation strategies for nutrition education curricula; directions for the 1980's in nutrition and health services; intraprofessional education and collaboration; and issues on nutrition education. Among the conclusions drawn from the workshop are those indicating a need for a variety of educational approaches, clinical relevance and application, clearly defined content, and the need to deal with the politics of curriculum development. Lists of exhibits and participants conclude the document. (JN)

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Emory

NATIONAL WORKSHOP

ON

NUTRITION EDUCATION

IN

HEALTH PROFESSIONS SCHOOLS

SEPTEMBER 30 – OCTOBER 1, 1981
WASHINGTON, D.C.

DIVISION OF NUTRITION
DEPARTMENT OF COMMUNITY HEALTH
EMORY UNIVERSITY SCHOOL OF MEDICINE
ATLANTA, GEORGIA

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NATIONAL WORKSHOP
ON
NUTRITION EDUCATION IN HEALTH PROFESSIONS SCHOOLS

September 30 and October 1, 1981
Washington, D.C.

Conducted by
Division of Nutrition
Department of Community Health
Emory University School of Medicine
Atlanta, Georgia

Contract No. 232-81-0015, Emory University School of Medicine, Atlanta, and Health Resources Administration, Public Health Service, Department of Health and Human Services, June 29, 1981.

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Purposes

1. To provide a national forum for the sharing of promising nutrition education practices in health professional schools.
2. To identify the major issues confronting nutrition education in the health professions.

Objectives

1. To provide opportunities for health professional schools to gain from the experiences of thirteen federally funded nutrition education projects.
2. To provide opportunities for health professional schools to gain an understanding of the major issues which face nutrition education.
3. To provide opportunities for health professional schools and health professions educators to gain an understanding of promising practices in nutrition education from leaders in the field.
4. To provide opportunities for health professions educators to understand the need for nutrition education for all health professions.
5. To provide opportunities for health professions educators to gain an understanding of nutrition education curriculum design, evaluation strategies, and management practices which foster and improve nutrition education for health professions students.

WORKSHOP AGENDA

Wednesday, September 30, 1981

Time	Topic	Presenter
8:00	Registration	Conference Staff
8:30	Welcome	Donna R. Watson, M.S., R.D.
9:00	Keynote Address	Keynote Speaker
10:00	Break	
10:30	Nutrition: An Essential Aspect of Medical Education	Eleanor A. Young, Ph.D., R.D.
11:15	The Nutrition Curriculum, Scope and Sequence	Roland L. Weinsier, M.D., Dr. P.H.
12:00	Lunch Visit Demonstrations and Exhibits	
2:00	Nutritional Care: The Physician's Role	Naomi Baumslag, M.D., M.P.H.
2:45	Nutritional Care: The Role of the Dietitian	Corinne Montandon, Dr. P.H., R.D.
3:30	Break	
4:00	Nutrition Education: The American Medical Association Perspective	Philip L. White, Sc.D.
4:45	Issues on Nutrition Education	Participant Work Groups
5:45	Adjourn	
	Exhibits open until 7:00 P.M.	

WORKSHOP AGENDA

Thursday, October 1, 1981

Time	Topic	Presenter
8:00	Opening	
8:15	Remarks on Issues in Medical Education	James F. Glenn, M.D.
8:45	Nutrition: Fact or Fiction	Robert E. Olson, M.D., Ph.D.
9:30	Management of the Nutrition Curriculum Panel	Marion Nestle, Ph.D. (Chair) William B. Bateman, M.D. Mary J. Beaubien, Ph.D., R.D. Jon P. Bowermaster, Ph.D. Maurice Levy, Ed.D.
10:30	Break	
11:00	Evaluation Strategies for Nutrition Education Curricula	Lawrence L. Gabel, Ph.D.
12:00	Lunch Visit Demonstrations and Exhibits	
1:30	Issues on Nutrition Education	Participant Work Groups
2:30	Interprofessional Education and Collaboration	Sylvia K. Fields, Ed.D., R.N.
3:15	Break	
3:45	Nutrition and Health Services: Directions for the 80's	Lenora Moragne, Ph.D., R.D.
4:30	Reflections on the Issues and Workshop Summary	Polly A. Fitz, M.A., R.D.
5:00	Adjourn	

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PREFACE

In 1979 grants for curriculum development in applied nutrition were authorized by section 788(d) of the Public Health Service Act. Subsequently, thirteen grants were awarded to colleges and universities to conduct projects in applied nutrition to enhance the education of health professions students in this field. An interdisciplinary approach was to be utilized in these educational programs. Each project was required to include medical students and two or more other health professions students.

Emory University School of Medicine, one of the grantees, proposed an annual conference of the projects receiving the curriculum development grants in applied nutrition. Such a meeting could provide the forum for sharing and discussing problems and/or strategies associated with implemention of these nutrition curricula and for reviewing methods and materials developed by the various projects. It was thought that information dissemination of this nature could be particularly effective and valuable to the outcomes of the individual projects and to the impact of the projects as a whole.

The first conference was held September 7, 8, 9, 1980 at the Woodruff Medical Center of Emory University in Atlanta, Georgia. There were 53 participants including representatives of every funded project. Besides formal presentations, time was allowed for small group discussions, audio-visual demonstrations, and materials review. Each project was provided poster board space on which to display project organizational structures, course syllabi, reference lists, and other materials.

In June 1981, Emory University School of Medicine was awarded a contract from the Bureau of Health Resources Administration, Department of Health and Human Services, to conduct a National Workshop on Nutrition Education in Health Professions Schools which would be similar to the workshop conducted the previous year at Emory. Guidelines for the workshop specified that it should be information sharing and that it should include presentations about the on-going HRA nutrition education grant and contract activities as well as other Federal and non-Federal nutrition education sources. Topics should address an overview of curriculum developments in nutrition education, professional skills required by health professionals in nutritional care, the process of interdisciplinary roles in nutritional care, curricular designs and evaluation strategies, and organizational structure and governance issues encountered in the incorporation of nutritional skills training into health professions education programs. A panel of expert consultants should be selected to provide guidance to the workshop planning and to present papers as part of the workshop program. Other speakers should be invited to talk about currently available curriculums, methods, and materials in health professions nutrition education.

The National Workshop on Nutrition Education in Health Professions Schools was held in Washington, D.C. on September 30 and October 1, 1981. Faculties of 120 medical schools and 15 schools of osteopathic medicine were invited as well as representatives of nutrition oriented organizations such as The American Dietetic Association, the American College of Nutrition, and the National Nutrition Consortium. Federal employees in nutrition activities were invited, also. One hundred and nine persons attended the workshop.

The two day program provided the participants with speakers well-known for their expertise in nutrition education in medical schools, presentations by curriculum development project directors, and small group work in which there was opportunity for discussion of issues relevant to implementation of nutrition curricula. Exhibits set up in separate rooms provided participants information and demonstrations of new audio-visual teaching materials, computer programs, textbooks, and course syllabi and materials used in various nutrition education programs throughout the country.

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NUTRITION PRIORITIES IN EDUCATION

Statement of Senator Bob Dole

First of all, I would like to congratulate this group of medical school and other health professions faculty for holding their meeting here in Washington. A special thanks goes to Emory University for their sponsorship of this group. All of you represent an area in which we share a long-standing, common interest: that of nutrition education in medical and other health professions schools. Incorporating this subject into regular medical training will enable physicians to better recognize and treat nutritional diseases; offer nutrition counseling to patients; and better utilize other nutrition professionals, as well as community nutrition resources like extension specialists, dietitians, and nutrition educators.

The Senate Nutrition Subcommittee held hearings on nutrition education in medical schools on two occasions: September 1978 and January 1979, as a result of more and more discussions in the Senate on the rising cost of health care. Following these hearings, over a million dollars was appropriated to go to educational institutions.

The Congressional intent was to train physicians to apply nutrition principles in their day-to-day practice. Back in the fall of 1978, I strongly supported and worked with Senator Bellmon on an amendment that would earmark funds for nutrition education in medical schools through the Department of Health and Human Services Health Resources Administration. Although the amount allocated was comparatively small, (about $1.5 million), it was a start. However, this program is no longer being funded, and the responsibility for carrying out this goal in medical schools throughout the country rests with all of you in the audience.

In order to incorporate more and better nutrition education in medical schools, there is much that this audience can do to help maximize current fiscal resources. You can scrutinize curriculum carefully to see where a **preventive**-oriented approach might replace some of the traditional treatment approach to medicine. Part of this effort would require recruiting and preparing more and better qualified people to teach nutrition to medical students and getting the medical community and the nutrition community to sit down and talk with one another about the issues, in a format similar to today's workshop. It will be important to identify medical school administrators who are sympathetic to the notion of adding a discipline like nutrition to the medical school curriculum.

Nutrition is often neglected in medical school curricula and considered only seriously when food supply is scarce, or when there is an obvious malnutrition present, such as obesity. However, the general public is vitally concerned about nutrition issues. USDA and DHHS have printed and distributed more than 7 million copies of the federal government's dietary recommendations on nutrition alone.

I am happy to see the current Administration's emphasis on disease prevention and health promotion. Dick Schweiker at DHHS has initiated a campaign to promote health and prevent disease. It started with broad health **goals** for the nation by 1990. Now specific **measurable objectives** have been identified to help implement these broad goals. A total of 15 preventive health areas are covered, including nutrition. Some of them are: high blood pressure control, pregnancy and infant health, immunization, physical fitness and exercise, stress control. One of the nutrition objectives states that "by 1990 virtually all routine health contacts with health professionals should include some element of nutrition education and nutrition counseling." If this objective is to become a reality and reached by 1990, it will take the help of all of you. Mr. Schweicker's prevention initiative will put together voluntary organizations, professional groups, academic people, consumers, state and federal government agencies, and the like to work together over the next few years on these long-range objectives.

Finally, as public awareness of the entire area of nutrition increases, the federal departments are working together and looking at an assessment of the nutrition status of the American people — what they eat, how much they weigh, how long they live, and what health problems they have that might be corrected or prevented by proper nutritional input.

On September 28th, Agriculture Secretary Block and HHS Secretary Schweiker sent letters to members of Congress (as Chairman of the Nutrition Subcommittee, I received a copy) outlining a joint implementation plan for a Comprehensive National Nutrition Monitoring System, designed to provide information on a regular basis about the contribution nutrition makes to the health of the American people. This plan utilizes HHS information on health status, dietary knowledge and attitudes, such as HANES (Health and Nutrition Examination Survey) data, as well as the vital health statistics and laboratory measurements supplied by the Center for Disease Control in Atlanta. USDA contributes its data on our food supply and composition, along with knowledge of the consumption habits of the American people. Both departments working together will be able to pool tremendous resources in developing a Comprehensive Nutrition Monitoring System, thereby providing better intelligence than we have previously had access to concerning the nutritional status of the American population.

This plan was sent to the Congress, but we at all levels of the federal government call upon you as medical school faculty members, as well as others who have a vital interest in the nutrition area, to work with the various departments and make certain that the objectives of this plan are implemented. Again, I would like to commend the people who organized this conference and have succeeded in getting physicians involved in the nutrition area, because good nutrition is becoming one of our nation's top priorities from the perspective of the general public, as well as the health professions. Finally, recognizing the limited resources of the federal government, I ask you for recommendations to help both the public and private sectors fully support and implement the goals of health promotion and disease prevention. Your input was invaluable in the budget process we recently completed in the Congress, and we look forward to working with you closely in the future.

BOB DOLE
Chairman
Subcommittee on Nutrition
U.S. Senate

NUTRITION: AN ESSENTIAL ASPECT OF MEDICAL EDUCATION

Eleanor A. Young, Ph.D., R.D.

I. Introduction

Medicine and nutrition are wedded in a vibrant and dynamic interface. Medicine deals with the science and art of diagnosing, treating, and preventing disease, as well as improving and preserving health. The science of nutrition is the study of food and its interaction with the totality of the human person (1-2). Nutrition can also be defined as the science of food and its relationship to health (3), or as the interaction of man and his food (4).

The interface between medicine and nutrition occurs at several levels: most obviously at the cellular level where biochemical reactions essential to life take place. Interaction also occurs at the organ and total body levels where physiological responses are dependent on adequate supply of essential nutrients. Medicine and nutrition also interface in the psychological and behavioral facets of eating patterns, and in the deepest recesses of the human spirit. It is here that good health and adequate nourishment uplift and refresh the human person, and also where disease and accompanying inability to obtain, digest, absorb and/or utilize nutrients are likely to burden the human spirit.

As shown in Figure 1, medicine and nutrition interface not only with each other, but also with the science, technology, and even art, of delivering health care. An increasingly important role in this dynamic interplay are delicate and complex human values of the patient, his/her family, and many personnel in the health care delivery system.

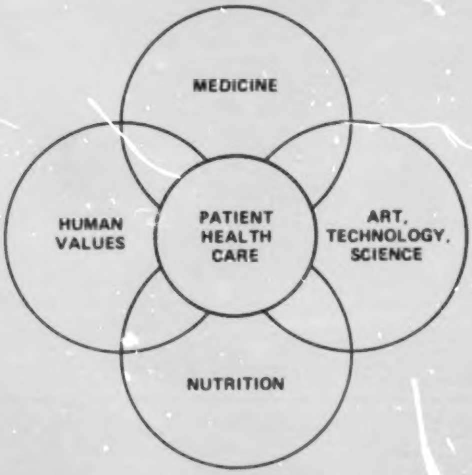

Figure 1. The dynamic interface between medicine and nutrition.

II. Conceptual Basis for Nutrition in the Medical Curriculum.

A conceptual understanding of the interrelationship between medicine and nutrition is critical to the continued development of clinical nutrition in medical education. Meaningful and effective clinical nutrition education must be solidly rooted in the concept that NUTRITION is an essential component of good health, health care and life itself (Figure 2). This may be viewed from several perspectives, clearly indicating that the physician's role in nutrition has several interrelated dimensions (5). Figure 2 shows nutrition as a **central, focal, essential** component of health and of health care. The physician may be involved in preventive medicine, in critical-care medicine, in long-term care of institutionlized or ambulatory patients, in research, or in education. The physician may be involved in all or in any combination on all of these components of health care.

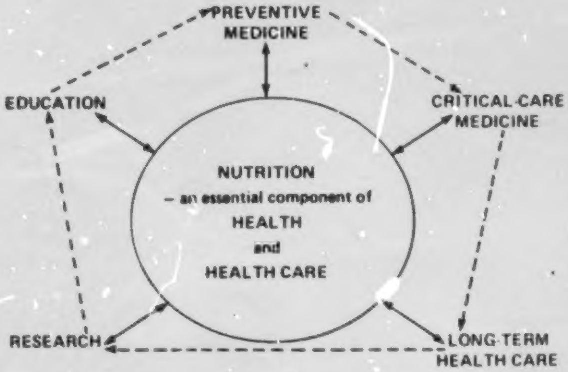

Figure 2. Nutrition — an essential component of health and health care.

A. Preventive Medicine

Directly or indirectly, every physician plays a role in preventive medicine. Epidemiological data and basic clinical research have clearly indicated a strong association between dietary patterns and the so-called "killer diseases" in our contemporary society, especially in affluent populations such as the United States (6-15). Physicians, as well as other health professionals, **should be** and **could be** major forces in preventive medicine. Medical schools have placed greater emphasis on training physicians to look for and treat nutrition-related diseases **after** they occur, rather than to concern themselves with **prevention** of nutrition-related disorders (16-17). Effective disease prevention cannot become a reality without strong support of the medical profession and other health professionals. Moreover, **prevention** of nutrition-related disorders has been cited as the most cost-effective and best scientific strategy in our conquest of nutrition-related diseases (18-26).

B. Critical-Care Medicine

Intensive nutritional support plays a life-sustaining role in the care of critically-ill patients. Modern medical and technological advances in total parenteral nutrition (27-34), enteral defined formula diets (35-39), and a variety of specifically designed supplementary formulas (41-44), make possible a much more aggressive approach to providing adequate nutritional suport for the critically-ill. Although these means of nutritional support are currently available, the application of these methods requires much greater knowledge of nutrition by the physician than previously acquired in medical training.

These newer approaches of nutritional support allow the physician to provide good nutritional care for patients with catabolic response to injury, burn, stress and/or infection, when nutritional needs may far exceed those required by the healthy person (27,29,33). For these critically ill patients, total parenteral nutrition and/or the use of defined formula diets can be effective in permitting normal growth and development, positive nitrogen balance, and therefore improving wound healing, and maintaining the full capability of the immune system to protect against infection.

Recent reports highlighting the frequency of protein-calorie malnutrition in hospitalized patients (45-52) serve to indicate the unmet nutritional needs of severely ill patients, as well as the necessity for the physician to be aware of and to assess these needs, and initiate or direct appropriate nutritional therapy. In the United States protein-calorie malnutrition occurs more frequently in hospitalized patients than in other population groups. Depending on the parameters used as a basis for assessment, protein-calorie malnutrition is prevalent in approximately 25 to 50 percent of patients cared for in the general medical and surgical services of large hospitals in the United States (45-52).

The incidence of protein-calorie malnutrition occuring in hospitalized patients is matter for serious concern. This is especially true since the reports indicate that protein calorie malnutrition is not confined to diseases like cancer, which is generally considered as having adverse affect on nutritional status, but is widely distributed throughout the range of disease categories. Moreover, these studies (45-52) clearly indicate that protein-calorie malnutrition is largely a result of not providing nutritional support when such therapy **could have been** provided.

Thus, the consideration of the role of the physician in the nutritional support of critically ill patients is not merely a theoretical concept, but a realistic challenge in modern medical care.

C. Long-term Health Care

The largest percentage of the total number of patients receiving medical care is for ambulatory patients seen in clinics, doctors offices, or extended care facilities. It is not known to what extent nutritional assessment and support are provided for these ambulatory patients. Also the prevalence of protein-calorie malnutrition among this sub-set of the U.S. population has not been well documented.

In recent years nutritional information and support for ambulatory patients is being demanded by physicians, and by patients. Thus, the role of the physician in providing nutritional care is a very direct one within a broad range of medical and health services. The impact of this role of the physician is likely to be in direct proportion to the knowledge and ability of the physician to see to it that nutritional care is provided. While some isolated studies (21-26) demonstrate the effectiveness of nutrition intervention in ambulatory patients, a great deal more needs to be done in this area (22).

D. Research and Medicine

Physicians have played a significant role in the advancement of new knowledge about nutrient requirements, the digestion, absorption, and utilization of nutrients, the interactions of drugs and nutrients, and in particular, how disease may modify the need and utilization of nutrients.

Major contributions in our understanding of nutrient-related diseases have been made through creative, innovative and well-controlled clinical trials, as well as through animal and human metabolic studies. Therapeutic advances in nutritional support are largely the end product of basic nutrition research (1-2). A recent review of current federally-supported human nutrition research, training and education has been published (54). This report identifies the important role of many physicians who are currently involved in nutrition research. Notable among recent developments include the federal funding of Clinical Nutrition Research Units through the Department of Health and Human Services, and the funding of six research centers under the U.S. Department of Agriculture.

Many physicians provide leadership in outstanding scientific nutrition societies that have as a primary focus the dissemination of knowledge drawn from current research. In this country these include: The American Society for Clinical Nutrition; The American Institute of Nutrition; The American College of Nutrition; and the American Society for Parenteral and Enteral Nutrition.

While most physicians are not involved in conducting an active research program, **all** physicians are obligated to keep abreast of current knowledge in their field of medicine. Since nutrition plays a role in almost all aspects of medicine, the physician has a responsibility for keeping up with with major advances in nutrition research, and to use new information in the care of patients.

E. Physicians as Educators

All physicians are educators either directly or indirectly. Directly, all physicians "educate" their patients although there is no objective data to assess the quality or quantity of such efforts. Indirectly, this educational influence of physicians impacts on society at large. The **potential** for nutrition education of society at large through health care is significant but difficult to assess. We do not know specifically how the educational benefits that patients derive from their physician influence health and health care.

As regards direct interaction with patients, the physician may provide nutritional care, correct nutrition misinformation, respond to a patient's nutrition concerns and questions, prescribe dietary modification, explain the rationale for such dietary therapy, and be able to offer nutrition referral to a registered dietitian for more detailed counseling. In fact, there is increased patient demand for nutrition information.

The physician may also be the educator of other health care professionals, and of the public at large. Physicians are often called upon to speak to different civic or scientific groups on medical problems related to nutrition.

While there is great **potential** for the physician to be an effective educator regarding nutrition in health and disease, recent testimony before the Subcommittee on Nutrition of the Committee on Agriculture, Nutrition and Forestry, United States Senate, provides abundant documentation that most physicians do not acquire adequate nutrition training during their basic medical education (55-57). Several national conferences held to explore nutrition education in medical curricula (58-61), as well as surveys carried out by the American Medical Association (62,63), have also documented the inadequacy of nutrition education for physicians. This must impact significantly on the effectiveness of the physician as educator and as disseminator of nutrition aspects of health care.

Recent funding and development of projects designed to provide greater emphasis on nutrition education in the medical curricula should better prepare physicians in general to be more effective educators of nutrition-related health care problems. Some of these projects include:

1. 1972-77. Special project grants for nutrition education. $1.3 million to eleven schools of medicine. Comprehensive Health Manpower Training Act of 1971, Bureau of Health Manpower.
2. March-August, 1976. Survey of nine medical schools to determine nutrition content in the curriculum. $10,000 awarded to Health Information Services, Inc. by the Bureau of Health Manpower.
3. 1976. The Nutrition Foundation was awarded $4,949 by the Bureau of Health Manpower to provide an annotated bibliography of all articles on nutrition education in U.S. medical schools.
4. 1976. Ohio State University was funded by the Bureau of Health Manpower, Health Professions Education Assistance Act of 1976, to develop 15 nutritional care independent study packages for family practice residents.
5. 1979. Bureau of Health Manpower under the Public Health Service Act (Public Law 94-484) allocated $1,500,000 for curriculum development and interdisciplinary team training in nutrition. Thirteen grants were approved and funded. Grants were refunded 2 additional years.
6. 1979. The National Institutes of Health provided funding for seven Clinical Nutrition Research Units. One objective of each unit was: "Strengthening training environments in order to improve the education of medical students, house staff, practicing physician, and paramedical personnel in clinical nutrition."

III. Factors in Development of Nutrition Program in the Medical Curriculum.

Many factors are related to the development of a nutrition program in the medical curriculum. Some selected factors follow:

1. It is essential that the school formulate, accept and strongly support a philosophical or conceptual basis for nutrition as an essential component in health care. This provides **roots** for the program. It gives a focus to continued growth, development and future direction of the program. It also provides a pivot around which goals and objectives are formed, revised and reformed.
2. It is obvious that goals must be formulated, as well as the specific objectives or strategies to accomplish the goals. Experience to date strongly suggest that there should be a logical progression of goals throughout the entire medical curriculum, so that basic concepts will be reinforced and allowed to develop. Educational experts also emphasize the advantages of having specific instructional objectives expressed in terms of measurable performance by the students.
3. Curriculum content should be clearly defined, and obviously should be based on concepts that physicians should know. This requires continual assessment of the entire medical curriculum for nutrition content so as to sequence and integrate concepts. Considerable care is needed in selecting clinically relevant, and meaningful instructional media and learning experiences for the student. Utilization of a variety of educational approaches would seem to have broadest educational impact.
4. Clinical application of nutrition concepts is a high priority. This includes the need to define nutritional care delivery roles, to focus on patient-oriented teaching and to plan realistic clinical activities. There is also the need to provide appropriate role models who in turn will demonstrate the required nutritional care skills, clarifying relationships between physicians and other health care professionals.
5. Evaluation of nutrition education is crucial to determine success of such efforts, and to point the way for future directions. Therefore evaluation strategies should be developed for nutrition content, clinical nutrition skills, as well as follow-up application in post-doctoral practice.
6. Full recognition and full support by administration, faculty and students is essential to the initiation and long-term survival of such a program. This requires identification of obstacles and hurdles that need to be surmounted, and working to achieve approval and support at all levels.
7. Funding is another obvious essential factor. Clear justification for funding based on identified needs is necessary. Sources of funding represent a major problem, and must be considered not only in regard to initial support, but also how this influences continuing local support. Some nutrition units have developed self-sustaining units that are cost effective. We must develop cost-effective studies that will strengthen the acceptance and approval of nutrition intervention as an important economic aspect of health and health care.
8. Every nutrition program requires leadership, invested with authority that continuously provides life and momentum to the program. Without this leadership, it is doubtful whether any degree of success can be achieved in developing an educationally valuable and viable nutrition program. Management strategies are needed for the development of a strong, progressive program and the avoidance of an aimless, status quo or mediocre program. Leadership may be achieved by utilizing a coordinator or director together with input from an interdisciplinary task force. Such an approach is especially appropriate for the field of nutrition, since nutrition cuts across all aspects of medicine. It would also facilitate the impact of role models. Leadership can be expected to be most effective when strongly based in an active clinical department, such as medicine.
9. An active nutrition research program strengthens the acceptance, participation and educational value of nutritional efforts in curriculum development. Research generates therapeutic advances, and provides a scientifically based role model of the physician. In particular, well-controlled clinical trials are sorely needed to support therapeutic nutrition intervention.
10. Community/public health issues often call on the active involvement of physicians and other health professionals with nutrition expertise.

IV. Considerations for Future Development

In addition to the above factors in development of nutrition programs in the medical curriculum, other considerations must be explored. Some of these considerations follow:

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1. Commitment of a medical school to develop a nutrition program (17,64-68)
2. Adequate funding for qualified nutrition faculty, development of a clinical nutrition support team, and adequate supportive clinical laboratory facilities (53,54). Greater emphasis on dietetic positions for more comprehensive dietary counseling and patient follow-up should be considered. Continued development and/or emphasis of nutrition research activities must be a high priority for a program of excellence.
3. The crowded medical curriculum and competition for time (69-71) requires continual assessment of educational (institutional) priorities.
4. Development of evaluation methodologies (72-77).
5. Incorporation of nutritional assessment and management by physician faculty and housestaff as a routine aspect of patient care (74,78-81).
6. Incorporation of nutritional support for ambulatory patient care (72-73).
7. Integration of the sociological, cultural, psychological and economic aspects of nutrition with the medical aspects of nutrition (82).
8. Need for recognition of nutrition as a clinical subspecialty in medicine (83-86).
9. Coordination of leadership in nutrition at federal and state levels (16,17,53,54,74).
10. Ways and means to effectively impact on the general public (3,87,91).
11. Adequate representation of clinical nutrition on examinations given by the National Board of Medical Examiners. (55,56,74).
12. Liason committee on medical education to provide greater emphasis on nutrition in accreditation of medical (78).

CONCLUSION

The challenge to implement, develop and maintain a realistic and effective nutrition program in medical education is great. It is also exciting for all those who are convinced that ***nutrition** is an integral, essential aspect of health, of health care, and of life itself.*

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THE NUTRITION CURRICULUM, SCOPE AND SEQUENCE

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I. Introduction

The primary goal of medical education is to prepare students to be concerned and competent deliverers of health care. To have omitted nutrition from the student's medical curriculum back in the 1950's and early 60's was perhaps understandable since classical deficiency states were no longer considered a public health problem and since nutritional contributions to coronary heart disease hypertension and cancer were still obscure. Now that nutritional factors have been implicated in at least 6 of the 10 leading causes of death and that hospital malnutrition is a recognized entity in this country, a graduating medical student can no longer be considered competent or have the knowledge to be concerned without having received an adequate understanding of the role of nutrition in medical practice. It is likely that the most prevalent nutritional deficiency in the United States today is the deficiency of nutrition information, a disorder that leaves the host susceptible to misunderstanding and the onslaught of misinformation. This situation has not gone unrecognized as evidenced by the reports of various committees and conferences (1-4), and, in fact, some remedial headway has been made according to the most recent American Medical Association survey on medical nutrition education (5).

In an attempt to eradicate this "deficiency state" at our own institution we reviewed the approaches of others, such as Christakis (6), Harlan (7), Young (8), and Baumslag (9), and considered the priorities that have recently been given to nutrition concepts believed to be essential in medical education (10-11). Our experience over the past 10 years at the University of Alabama in Birmingham now affords us the opportunity to evaluate the steps we have taken to achieve our present position. In the process of this review it became evident to us in the Department of Nutrition Sciences and to our collaborators in the Office of Educational Development that two factors were of particular importance and warrant major attention. In this report I will describe the evolution of our nutrition education program relative to the course content and sequence, but emphasize the two factors that we feel are critical to the development of any successful medical nutrition teaching program.

II. Evolution of the Role of Nutrition in the University of Alabama in Birmingham Medical Curriculum

From 1971 to 1975 nutrition education was fragmented with several hours scattered among several basic sciences courses. In 1976, for the first time, nutrition was taught as an identifiable segment of the sophomore gastroenterology course. Because the nutrition topics were not representative of the major current nutritional problems, student interest was low, and because there was no requirement to pass the nutrition exams, class attendance was poor. In 1977 nutrition was presented as a 16 hour required segment of the sophomore metabolism-endocrinology course. The coursemaster, a physician-nutritionist, put major emphasis on teaching material that was highly relevant to clinical practice. In addition the coursemaster presented the majority of the lectures in order to maintain control of the course in terms of its content, delivery and purpose. Student acceptance rose dramatically.

A combination of student enthusiasm and reorganization of the medical curriculum resulted the next year in establishment of a separately identifiable required course for the freshman students entitled, "Introduction to Clinical Nutrition." Since 1978 this course has received the enthusiastic support of the students as well as the curriculum committee and has gradually expanded from 38 to 52 class contact hours. Each year the course is evaluated using a student critique form that is submittee anonymously and voluntarily. This year's course critique, to which 140 of the 151 medical students responded, revealed that 92% of the students rated this introductory course as better than most of the courses offered in their freshman medical curriculum; moreover, 67% of the students gave it their top ranking as one of their best freshman courses.

Parallel with the development of the nutrition education component of the medical curriculum, the Nutrition Support Service for the medical complex rapidly expanded. As more students graduated from the freshman nutrition course, increasing numbers requested a fourth year clerkship to spend time with the Nutrition Support Service. This elective has now reached saturation in enrollment and has become competitive for admission. With at least one half the senior class of 165 students applying for the 12 openings, it is now ranked as one of the most requested electives on campus.

III. Factors Felt to Be Critical to the Development of a Teaching Program

Throughout development of a nutrition teaching program for medical students, educators from the Office of Educational Development worked in close cooperation with the Department of Nutrition Sciences. Upon review of the many possible factors that may have contributed to the program's success we have identified two that we feel are critical.

1. Relevance of course material:

Course content was selected to emphasize clinical applicability but not at the expense of basic nutrition knowledge. In order to arouse interest and show relevance of the material we decided to open the course with an area of applied nutrition, "Nutritional Aspects of Growth and Chronic Diseases," rather than taking the traditional approach of starting with basic biochemistry and physiology of nutrition. This section, 20 hours in length, encompassed the common nutrition related disorders of obesity, maladaptive eating behaviors, diabetes, cancer, hypertension, vegetarianism and health food trends, growth and pregnancy, coronary artery disease, and dental disease. In the second section we then moved back to cover the basics of nutrition, 14 hours encompassing energy metabolism, biochemistry, physiology, requirements, food sources, deficiencies and excesses of vitamins and minerals. The third segment of the course was intended to again raise the student's level of consciousness to the applicability of nutrition and dealt with support of the hospitalized patient, a segment of 18 hours covering hospital malnutrition, nutrition assessment, therapeutic diets, enteral and parenteral feeding approaches, and selected clinical situations such as nutrition support of burned and septic patients, malabsorption syndromes, and renal failure. Actual case material, patient photographs, and laboratory data were used frequently during presentation of clinical information. For one-hour workshops were included in this section wherein the students were expected to utilize the reference text (*Handbook of Clinical Nutrition*, Weinsier and Butterworth, C. V. Mosby Company, 1981) to work through the history, physical findings, and laboratory data of case studies and to make recommendations for support. These small group sessions were rated by 60% of the medical class as being one of the most important teaching tools of the course.

Thus, the course content was planned to cover at least the fundamentals of basic nutrition and the role of nutrition in the prevention and treatment of common disease states. Of equal importance, the course was designed to maximize the student's awareness that nutrition is a vitally relevant subspecialty of medical practice. The need to demonstrate the clinical relevance of the nutrition concepts presented was also emphasized by the respondents to a survey carried out by Gallagher and Vivian in 1979 (11). In trying to establish student acceptance of nutrition education in the medical curriculum we felt a second factor was of equal importance as the relevance of the material.

2. Positive Role Modeling:

Setting positive role models for the medical students was considered at two levels of their training: in the freshmen nutrition course and in the clinical clerkship. In the freshman course modeling was carried out by having a physician-nutritionist as a coursemaster with high visibility throughout the course. Since the coursemaster was also the head of the Nutrition Support Service, it was hoped that the role of the physician in clinical nutrition would be readily evident. In addition, 5 of the 12 course instructors were physicians in various subspecialties but all with a commitment to nutrition.

For the first three years of development of the freshman course no dietitian was included among the course instructors. Although, many highly qualified clinical and research dietitians were available from the Department of Nutrition Sciences, the Nutrition Support Service and University Hospital, we intentionally tried to remove any reinforcement of the stereotype that nutrition falls solely under the domain of the dietitian or that clinical nutrition deals primarily with dietetics. Then over the past two years a dietitian was included among the instructors to represent the interdisciplinary nature of nutrition support services. Presenting three lectures and conducting one of the four case study workshops, she was very well received, better in fact than three of the five physicians. The second level at which we tried to achieve a strong, positive role model was in the clinical years. Over the period of the past six years, a 4-week clinical elective had been established for second and third year postgraduate medical residents wishing to spend time with the Nutrition Support Service. With increasing visibility of the Service, as evidenced by the rise in the number of consults (from 160 patient visits in 1975 to 2300 in 1980) and the number of residents taking the elective (4 in 1975 to the maximum of one each month in 1980), students expressed increasing interest in the rotation which had never been advertised.

Thus, the roles that have been modeled for the students have been those of a physician-nutritionist who is coursemaster of both the introductory freshman course and the clinical elective, the otehr physicians involved in both courses, the medical residents who work side-by-side with the students during the clinical clerkship; and finally, the staff physicians who indirectly espouse the importance of nutrition in patient care by consulting the Nutrition Support Service. That a physician specializing in nutrition, rather than a dietitian, should serve as the focal point for nutrition education has been previously mentioned in a report to the U.S. Senate on nutrition training of health professionals (12). However, the complementary input of non-physician instructors at both levels of student training in no way detracts from the physician role model; rather it reinforces the multidisciplinary nature of nutrition as well as the need for interaction among various professionals in a team approach to patient care.

CONCLUSION

To reiterate, from our experience we feel that two factors are critical to the development of a successful nutrition education program for medical students. These are the demonstrated relevance of the course material to the future physician's medical practice and the presence of a strong, positive role model as a physician-nutritionist. Practically speaking, however, there are at least five other factors that have to be considered in developing a teaching program.

1. Should this program include a required or an elective course?

We feel that, if possible, both should be included using the elective clinical clerkship to reinforce, expand and apply what has been presented in the required introductory course. Material learned in the basic sciences is often forgotten unless reinforced during the clinical years, a point made by Jack Rutledge, past president of the American Medical Student Association in his testimony before the U.S. Senate Subcommittee on Nutrition in 1978. As of the latest American Medical Association survey in 1978 (5), only 10% of the 123 responding medical schools offered both a required course and an elective clerkship.

2. Should the nutrition coursework be separate or integrated into other medical courses?

Nutrition is somewhat unique among the medical subspecialties in that it is not limited to a single organ system. In this respect it could be argued that it should be taught in conjunction with, and as it applies to each of the separate subspecialties. This is basically the approach described by Christakis (6). Philosophically, however, I am opposed to this approach at least at the present time. Clinical nutrition is still going through an identity crisis that was referred to in the past by Dr. Sebrell as "the blurred image of nutrition" (13). Nutrition is still a new product that needs to be better identified to be sold. One of our best advertising approaches is to maximize the awareness of our future physicians that nutrition is a distinct and vitally relevant subspecialty of medical practice. To do this I believe it must be presented as a separately identifiable course.

3. What should be the exact course content?

In this regard we need to remind ourselves that **all** the necessary nutrition material cannot be taught, no less learned. The intent should be to prepare a student to learn forever. This is most likely to occur if we demonstrate the relevance of the subject, arouse interest, and then give at least the basic tools and reference material for future learning. Thus, beyond certain basics necessary for the undifferentiated physician, it is probably a mistake to try and define the exact course content that should be taught at every institution. It is interesting to note that of two separate surveys made in the same year of physician and non-physician specialties in the area of nutrition there was evident disagreement in the priority list of the nutrition concepts felt to be essential for medical student education (10-11).

4. When should nutrition be taught relative to other courses?

We feel that our basic course material is better received and understood after the students have been introduced to biochemistry and physiology. Beyond this contraint, it probably makes little difference whether the course is presented in the first or second year of medical school. We do feel, however, that many of the aspects of basic nutrition and preventive medicine may be better received during the basic sciences years before the student is deeply involved in acute care, symptomatic medicine in the hospital setting. To selectively teach applied nutrition in the second year and only basic nutrition in the first year risks loss of student interest during their first exposure by not seeing clinical relevance of the material.

5. How much medical curriculum time should be allotted to nutrition?

This is as difficult to define as the course content. The 52 hours of required class time of our freshmen course represents a relatively large fraction of curriculum time compared to most institutions(5). Nevertheless, 96% of the students requested that at least that amount of time continue to be devoted to nutrition, and 35% requested even more time. Although the curriculum committee has placed no limit on the number of hours we may devote to our freshman medical course, we maintain and suggest the philosophy that only as much time should be requested as can be justified and that every hour of student time must be used well.

The applicability of our experience at the University of Alabama in Birmingham to other institutions is uncertain. Recognizing that contraints are extremely variable from one institition to the next, our answer may not be another's solution. Nevertheless, we believe that relevance of course material and positive role modeling far outweigh the other variables that are often given higher priorities, and that these two factors are key to the successful development of any medical nutrition education program.

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ACKNOWLEDGEMENT

I would like to express my gratitude to Drs. Carlos Krumdieck and C. E. Butterworth, Jr. of the Department of Nutrition Sciences and Drs. Michael Brooks and Sam Brown of the Office of Educational Development for their invaluable assistance in development of the medical nutrition education program and in preparation of this manuscript.

NUTRITIONAL CARE: THE PHYSICIAN'S ROLE

Naomi Baumslag, M.D., M.P.H.

The Goldberg era adequately demonstrated that not all disease was caused by infections as was thought to be the case with pellagra until niacin deficiency was described as the cause. Still the concept that infections and viral disease are the major causes of ill health prevails in spite of increasing evidence that diet is important in health as well as illness. Drugs modify diet utilization; food processing alters nutrients; new foods such as formulas are constantly being made available. Their impact on obesity and cardiovascular disease and cancer has yet to be assessed.

In the USA simple deficiency diseases disappeared with the advent of fortified foods and as vitamins appeared on the market. Nutrition as a medical discipline faded only to be revitalized as the relationship between infection and nutrition, cancer and nutrition, drugs and nutrition and life prolonging therapy and nutrition began to be understood and its importance recognized. Chronological aging was no longer synonomous with biological aging. Interest in breast feeding brought about a detailed analysis of breast milk, stimulated milk banks and the bioengineering of breast milk. New concepts of parenteral feeding had an impact on premature low birth weight and newborn infants as well as on chronically ill and elderly patients. Despite all this, medical school curricula continue to lage behind and disease oriented precepts fail to prepare the new doctor for the task of effective nutritional intervention.

Nutrition as a practical aspect of prevention is rarely a recognized part of preventive medicine and the latter is frequently a poor relation in the medical school. An examination of medical school curricula reveals that out of 129 schools 120 include a required course in pharmacology averaging 200 hours; but only an estimated 30 schools have a required course in nutrition averaging 20 hours, and this has been called progress by the AMA.[1]

While health practitioners associate malnutrition with developing countries they fail to recognize, and consequently deal with, the huge problem of malnutrition in the USA, or to appreciate that overweight, too, is a form of malnourishment. In our country 30 percent of adults over 30 years are obese. It is estimated that there are 10 million obese adolescents in the USA. In the USA 14 percent of preschool children are overweight, defined as over the 85th percentile for weight on the Iowa Growth Chart.[2] In the Women Infants and Children program (WIC) of food supplementation sponsored by the USDA, 12 percent of infants are in the 97th percentile for weight, graphically illustrating that food without nutrition education is not only costly but has potential long term ill effects. In addition, it has been estimated that two million patients a year suffer from hospital caused malnutrition, much of which is undiagnosed and untreated.[3] Evidence shows that after two weeks stay in the hospital, 25 percent of patients have protein calorie malnutrition (PCM). Nixon, et al. have shown that patients with cancer also suffer from malnutrition.[4] Cancer cachexia is not inevitable and the effects of drug and radiation treatment can be ameliorated by effective nutritional assessment and treatment. These examples emphasize that research is just beginning to show that both the curative and preventive aspects of applied nutrition have significance in the wards and increasingly in the community.

The nutrient needs of populations and sick patients are changing due to a variety of factors such as food processing, new dietary patterns, alcoholism, and drug interactions. To mention a few examples: pellagra induced by tuberculosis drug therapy has been described; Victor Herbert has shown that an excess of vitamin C produces B_{12} deficiency;[5] several cases of B_{12} deficient breast fed infants of mothers on strict Vegetarian diets were reported;[6] but had dietary histories been taken during pregnancy, the unnecessary costs and consequences could have been avoided. Recently 118 infants developed a syndrome of failure to gain weight, loss of appetite and lethargy. Laboratory findings revealed hypocalcemic, hyponatremic and hypochloremic metabolic acidosis. These infants were all on Neo-Mul-Soy formula or a related soy product believed to be low in chloride.[7] It took consumers and a few observant physicians to finally get the Food and Drug Administration (FDA) to take steps to have the product taken off the shelves. If it had not been for their persistence, those children might still be diagnosed "degenerative disease of unknown etiology."

Physicians are considered to be the main source of health information, reightly or wrongly, and often they give advice so poorly that patients go to health food stores for advice. One patient of ours had a skin eruption on sun exposed areas; she was asked by her physician for a venereal disease history but not a dietary history and was treated with a number of ointments which only aggravated her undiagnosed pellagrinous skin condition. The health food store on the other hand gave her B complex vitamins and in a few days a dramatic improvement took place. No wonder health food remedies gain such credibility.

Another patient could not get help from her physician for her child's arrested growth; after reading "Prevention Magazine" she went to a health food store for hair analysis. She had decided the problem might be lead poisoning and the store offered hair analysis for dietary needs! She had several hair tests and after I had given testimony at Senator McGovern's Hearings on Nutrition Education she wrote to me asking me to interpret the results because she had no physicians who would help her! Unfortunately more attention is centered on blood pressure than on weight. No one denies the importance of hypertension, but histories and medical examinations should be balanced and thorough, not lopsided or clinically prejudiced. Failure to thrive is a significant problem among children in this country and warrants using the growth chart as an educational tool.[8]

It is argued that it is impossible for the doctor to provide nutrition education and assessment due to time constraints, and that a nutritionist has to do this; however, the reality is that where there are federally supported programs it suddenly all seems possible. Since nutritionists' services are not reimbursable under Medicare, it is up to doctors in general practice to provide nutrition counseling. In a recent survey of Maryland practitioners it was found that many were nutritionally ignorant, e.g., an obstetrician advised pregnant women in his practice to restrict their dietary intake to only 1,000 calories per day. A majority of physicians surveyed felt that they should have had nutrition education in medical school.[9]

Opinions regarding maternal and infant nutrition practices among general practitioners, pediatricians and obstetricians in the province of British Columbia were surveyed by mail questionnaires. Scores were significantly higher for physicians who (a) were female, (b) consulted with a nutritionist-dietitian, (c) had additional training, (d) attended continuing education programs, and (e) had studied nutrition in their medical school curriculum. The scores of pediatricians and obstetricians were significantly higher than those of general practitioners.[10]

Where can the physician-to-be learn about clinical nutrition? Only from biochemistry courses and judging from the deficiencies noted in physician performance this is not enough. Evidence is available that clearly documents that few medical schools have required clinical nutrition courses.[11] This is not surprising as nutrition is not required in the medical school curriculum for accreditation by the Liaison Committee on Medical Education of the Association of American Medical Colleges and the AMA Council of Medical Education. Furthermore, the National Board Examination has only three percent of nutrition related questions and this, too, acts as a disincentive for students and even medical school teachers.

Survey of National Board Exams

An examination of the National Board Exams for Senator McGovern's Sub-Committee on Nutrition revealed that not only was the quantity of nutrition questions extremely low but the quality was also wanting.[12] (Table 1) "Nutrition" questions were focused either on biochemistry or endocrinology.

Furthermore, in over 2,000 questions, only one question was on infant nutrition! No wonder doctors know little about infant feeding and rely on baby food companies to provide information. The only question on breast milk asked was if chlorpromazine causes lactorrhea. There were no questions on required daily allowances (RDA) for pregnant and lactating women and infants; nothing on prescribing diets, nutritional assessment, or even parenteral nutrition. This amply revealed that exams which dictate student interest do not include applied nutrition or even current concepts of nutrition. As a result of the recommendations based on this survey, it now appears that where formerly there was no nutritionist on the board of examiners, one is to be included, and an effort will be made to include clinical nutrition questions in future examinations.

Although Congress demonstrated its interest in nutrition the previous administration was not particularly responsive. Federal spending in health was in excess of $63 billion yet HHS's Bureau of Health Manpower spent only $1.4 million on nutrition education (1972-1977).[13] This figure was increased for interdisciplinary nutrition education programs. What the future holds for nutrition education at the hands of the current administration remains to be seen.

Programs in Medical School Throughout the Country

The American Medical Association (AMA) through mail questionnaire has carried out two surveys, one in 1976 and one in 1978.[14,15] The 1978 survey shows that of 124 accredited schools 118 responded. Required courses rose from 19/102 to 30/118; a slight increase to 25 percent in required courses expecially in the new medical schools. Eighty-four medical schools (71%) offered electives in the basic science years; 106 (90%) incorporated nutrition into other courses (whatever that might mean), 43 (37%) medical schools had clinical electives (few students took them); and 100 (85%) had nutrition research opportunities; 58 (50%) offered continuing medical education courses in nutrition. The average length of the required course was 20 hours. Of the responses to the 1978 AMA Survey, 97 percent taught nutrition as part of another course.

The American Medical Association's survey found that "medical education and medical practice have not kept abreast of the tremendous advances of nutrition knowledge and that there is inadequate recognition, support and attention given to this subject in the medical schools."

When Dr. Grant[16] examined four medical school programs the major weakness apparent was in teaching student physicians how to elicit and evaluate a patient's diet history, how to assess a patient's nutritional condition and how to counsel a patient about diet.

Table 1

*Review Of National Board Exams 1978, (Jan. 24, 1979) — Nutrition Questions
(Strictly Biochemistry Or Physiology Questions Excluded)

	Total Number of questions	Number of nutrition questions
Part I:		
Section:		
A	155	1
B	168	5
C	182	4
D	142	0
E	161	6
F	171	12
Total	984	28
Part II:		
Section:		
A	146	6
B	164	6
C	155	4
D	142	2
E	154	3
F	134	2
Total	895	23
Part III:		
Section:		
A	130	10
B	130	1
C	NA	NA
Total	260	11

*Ref. 12.

What Can Be Done?

In 1973 at Emory Medical School we decided, with the assistance of students and faculty and approval of the curriculum committee to develop an Interdisciplinary Clinical Nutrition course and track.[17,18]

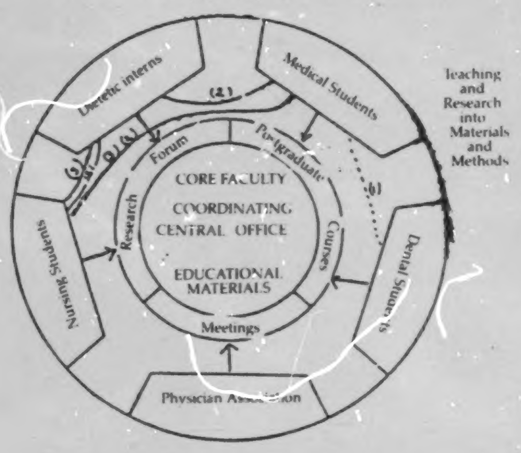
In the first year, 6 hours of nutrition were included in biochemistry. In the second year a 24 hours interdisciplinary nutrition course was required for medical students, nursing students and dietetic interns. For special students, overseas electives were available. In the Clinical Research Facility, Emory University Hospital, and in other selected sites, nutrition clerkships, ward rounds and special lectures were offered. Research opportunities in nutrition were also available. (Tables 2-5).

We attribute the success of our program to several considerations:

1. Faculty, students, community and administration perceived the need for such a program;

Figure 1[12]

EMORY MEDICAL SCHOOL NUTRITION PROGRAM
Team Approach Emphasis


Dietetic interns
Medical Students
Teaching and Research into Materials and Methods
(2)
(1)
(3)
Forum
Postgraduate
CORE FACULTY
COORDINATING
CENTRAL OFFICE
EDUCATIONAL MATERIALS
Research
Courses
Nursing Students
Dental Students
Meetings
Physician Association

(1) Shared patient experience*
(2) Shared lecture and workshops
(3) Clinical experience with nursing students

2. There was a faculty commitment and willingness to share resources such as expertise, equipment, and even chores;

3. An interdepartmental group was formed that included people with nutrition expertise from the Centers for Disease Control (CDC), the Department of Human Resources, and from schools, such as Georgia State University and Spellman College, in order to have as broad a base of expertise as possible;

4. Clinical departments were provided with feedback from the home and community level;

5. Research opportunities were provided and nutrition faculty involved.

6. Key nutrition gaps were identified in courses and clinical experiences in the wards and in out-patient clinics (for example, we found that breast feeding did not receive enough attention in antenatal clinic; ward diet prescriptions were often wrong due to uninformed physicians — The American Dietetic Association prescriptions were used instead of individually calculated prescriptions for diabetics; low protein diet was prescribed for a child with renal failure, 8 gms/day only with milk shakes in between!). Special areas were covered by didactic lectures and handouts of articles and tables carefully selected.

7. Basic biochemical and nutriton knowledge of students was assessed using a multiple choice pretest in order to establish a base line. Results revealed gaps. (Figure 2) Two percent of the students knew fat should be restricted in steatorrhea; 17 percent knew which factors enhanced iron absorption and four percent knew the RDA for iron in pregnancy; four percent knew that Vitamin A and Vitamin D are added to milk.

8. Students were motivated by personal involvement in their own dietary history, anthropometric measurements and blood chemistries. The mean caloric intake was 2,132 calories and the range was 881 - 5,230 calories/day. Protein intake ranged from 32 - 233 gms! (Table 6). The distribution of calories, carbohydrate, fat and protein content is shown in Figure 3.

   Diets went "haywire" during exam time; for some reason a much higher protein intake was prevalent. Athletes like others often believe that protein is important for energy! Some students even used Hoffmans energy pills. They could have obtained the same nutrients for half the price if they had taken skimmed milk powder. (It is ill-founded beliefs such as these that the student brings to his/her practice as a doctor!).

   Several students were found to have low hemoglobin and high cholesterol levels.

9. Students were sensitized to patients, problems and needs through:

   A. A tasting luncheon. A buffet luncheon was provided for the class as a practical teaching experience. Students were provided with a menu and each was asked to select one of three diets, (1) 1,000 calorie diet, (2) a fat controlled diet, or (3) a 500 mg. sodium diet. They were provided with instructions for diet selection from a hospital diet manual. Results supported our hypothesis that there was a gap between learned and applied knowledge. Dietetic interns checked the medical students' selections and pointed out errors. Interesting discussion ensued. Results revealed that only 50 percent selected the 1,000 calorie diet correctly; 49 percent selected the fat controlled diet correctly. Errors included selecting cabbage labelled "cooked with fat" and cornbread on the fat controlled diet. Patients with less education, however, are expected to manage this easily! The worst selection was for the 500 mg. sodium diet which only 16 percent selected correctly, not realizing that foods such as cottage cheese and canned peas are sources of sodium. When allowed to return to the tables for more food everyone went back for bread, butter and desserts. (Table 7).

   B. Home visits. Since the community and home care are of paramount importance to a patient's compliance with prescriptions or recommendations, home situations should be experienced. At Emory the home visits, carried out with adequate guidelines, careful patient selection and faculty support, were very rewarding. They also provided the opportunity for team efforts consisting of medical, nursing and dietetic students and occasionally a dental student as a consultant. In this way the students got to work together professionally. Since this was an important focus of our program, course time was provided for the experience.

As a result of these home visits difficulties, with compliance, habits and beliefs, the use of health food stores, marketing practices, reading labels, the effects of advertisements, and many other factors which influence curative and preventive medical services, were learned and understood. In this way academic exercises were transformed into practical realities. Patients complained about the expense of the diet and that often they were hungry. Those on 800 calorie diets said this made them constipated and believed that the fat restriction caused the constipation. Another patient stated she ate apple pie and cakes because she was not allowed to eat sweets. Others complained that their diet made them feel tired and weak. Some patients stated that they did not want to be old skinny ladies. Others resented the clinic nurse who told them to lose weight when she was several times their size. Some patients complained that with weight loss they had to buy clothes and that was expensive.

It is becoming increasingly evident that more outreach programs will be needed in the community before health care has a full impact in terms of disease prevention. For example, if infant weights were carefully recorded, noted, and addressed, failure to thrive could be prevented and much of the infantile obesity and subsequent heart disease and diabetes could be reduced or even prevented. Much more attention needs to be paid to diet since good nutrition is perhaps the most important preventive tool we have and the efforts to improve nutritional status of the population should be concentrated in the communty. The new frontiers of nutrition are intriguing and challenging and there is much that can be done.

Table 2

Nutrition Course Objectives

1. Work as a member of the team
2. Conduct a nutritional assessment
3. Learn to evaluate and apply dietary information at the practical level
4. Manage and diagnose nutritional disease and deficiency
5. Stimulate interest and nutrition research

Table 3

Nutrition Concepts

Nutritional Assessment
Role of Nutrients
Requirements for Infancy, Pregnancy, Lactation and the Elderly
Diet and Health
Sound Dietary Practices
Critique Popular Diets and Claims of Food Fads and Health Food Stores
Management of Disease States, especially Coronary Heart Disease, Obesity, Diabetes and Hypertension
Parenteral Nutrition
Genetic Disease and Diet Modification
Diet and Cancer
Impact and Relationship between Infection, Injury, and Drugs

Table 4

Nutrition in the Medical School Training

First Year Nutrition in Biochemistry
Second Year Clinical Nutrition
Third and Fourth Year Clinical Electives
Overseas Nutrition Electives
Research
Rounds
Nutrition Seminars
Consultations
Continuing Education
Community Involvement

Table 5

Course: Second Year Clinical Nutrition Required 24 Hours

Identified Gaps in Curriculum
Student Nutrition Knowledge Tested
*Ascertained Student Needs and Interests
Lectures
Practical Labs
Films Displays
Dental Assessment Lab
*Diabetic Patient Assigned (Team Home Visit)
Individual Student Nutritional Assessment
Case Presentations
*Nutrition Paper or Study
*Tasting Luncheon
*Examination
Course Book — Reading and Resources

*Evaluation

Table 6

Daily Dietary Intake (4 Day Record)
106 Medical Students

V	Mean	SE	SD	Range
Calories	2,132	64	659	881-5230
Carbohydrate (gms)	238 (45.7%)	7.9	82.3	89-576
Protein (gms)	82.9 (15.8%)	2.6	26.9	32-229
Fat (gms)	91 (37.4%)	3.3	34.9	39-576

(%) Percent Calories as . . .

Table 7

Prescribed Diets — Analysis of Medical Students Performance

Diet Prescribed	Correct	Errors
1,000 Calorie	50%	Missed Exchanges such as Bread, Fruit and Fat
Fat Control	48%	Failed to recognize fat sources such as broiled chicken with skin; country style cabbage even though labelled "cooked with fat"; cornbread
500 mgms. Sodium	16%	Failed to realize high sodium in canned peas and in celery; cottage cheese was only considered as protein and nothing else!

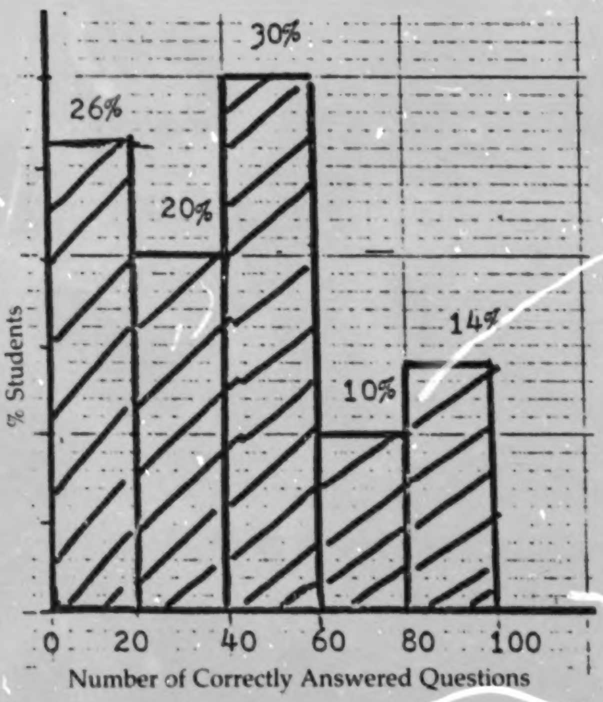
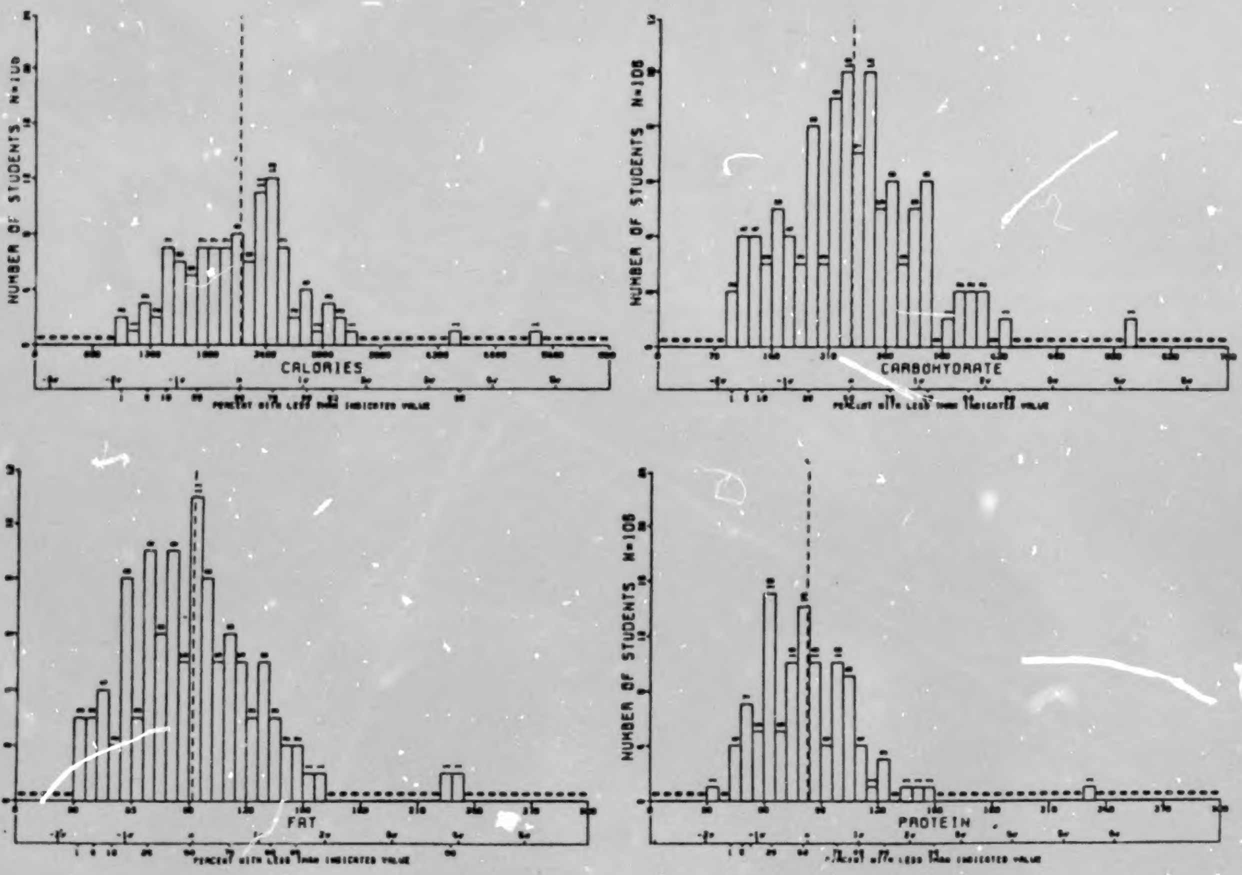


Figure 2

Nutrition Knowledge Assessment
Class Profile

Figure 3

Medical Students' Daily Intake Calculated From A 4-Day Diary



Conclusion

Currently lack of education and basic technical skills, even for nutritional assessment, leaves the practitioner ill-equipped to provide adequate preventive care and support for patients. The greater the distance the practice is from the teaching hospital, the more rural and less elaborate the practice, the less likely a nutritionist will be available even as a consultant. The physician without adequate background training must therefore deal with diet management using brochures e.g. from the American Diabetes Association, drug companies or food manufacturers in place of a calculated individualized prescription based on the best current scientific information. Or a busy practitioner may delegate the task to a nurse with a little or no training in nutrition.

Weight is recorded in most practices but the reliability of scales and the attention paid to developing a nutrition plan appropriate to the patient's needs, in my experience, is often glossed over. Weight may not even be recorded. I have found this to be the case in a family medicine residency program at a university training hospital with funding, sufficient staff and a low patient load. Weight is recorded and left at that. In the elderly especially weight changes should be carefully monitored.

The physician is often the team leader and as such must be the initiating force to screen, counsel and plan intervention programs. Information, e.g., about harmful foods, vitamin and health food facts and fallacies should be available for the community. In practices where there are unusual patterns of illnesses, e.g., high prevalance of cancer or anemia, the physician has a chance to contribute to the science of nutrition as well as the care of the patient. The physician should be aware of usual beliefs and practices in his community.

Federal, state and local agencies should provide the funds for continuing education in nutrition of medical students, housemen and physicians in practice, as well as for nutrition research in office practice at the applied level to improve the health, quality of life and longevity of patients.

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NUTRITIONAL CARE: THE ROLE OF THE DIETITIAN

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INTRODUCTION

At the Williamsburg Conference on "Guidelines for Nutrition Education Programs," three professionals were identified as the core team for teaching nutritional education in a medical school setting: the clinician, the basic scientist, and the dietitian/nutritionist (1). It is the last, the dietitian/nutritionist, that will be the focus of my remarks. In this text, the term "dietitian" is used to include both the nutritionist and the dietitian who are active members of The American Dietetic Association (ADA). Both titles refer to those whose specialty is human nutrition. Though the ADA does not distinguish between these titles, by tradition a nutritionist usually has an advanced degree and/or is involved in medical education or in community nutrition; a dietitian usually is concerned with hospital dietetics.

The fundamental knowledge of foods, nutrition, and nutritional care makes the dietitian a unique member of the medical team. With the academic background of the basic sciences, food science, behavioral sciences, and therapeutic nutrition, the dietitian is the professional who can transcribe the science of nutrition into practical, useful information for members of the health care team as well as for lay persons.

Discussion today will focus on: a) the historical perspective and educational requirements of the dietitian, b) the identification of the dietitian with emphasis on the clinical dietitian as a member of the health team, on the nutritional support team, as a nutritional counselor, and as an educator within the hospital setting and the medical school, and finally c) suggestions for expanding the dietian's performance in the medical setting.

HISTORICAL PERSPECTIVE

A brief overview of history illustrates the evolution of the role of the dietitian in the nutritional care of patients.

During the late 1800s, the use of foods related to patient care became important to the medical profession. Hospitals began to enlist culinary specialists to teach foods and nutrition to nurses (2,3,4). The Women's Medical College in Philadelphia included such a course in the curriculum of medical students (3). The significance of therapeutic nutrition was noted by the institution of diet kitchens where patients housed in hotels could follow their diets (2,3,4). Further, classes in experimental nutrition were initiated for physicians (3).

From the book, **History of the American Dietetic Association,** we read that in 1887, a Committee on Dietetics was appointed by the American Medical Association; an editorial stated: "Is sufficient attention now being given to it (dietetics) by the American medical student? Or is the average practitioner as well posted as he should be on these topics? We should give the physician as much knowledge upon the preparation for the sick as the trained nurse. Which American college will be the first to have a Professor of Gastronomy, or if preferred, of dietetics (5)?"

All aspects of food, food services, and dietary (nutritional) care were responsibilities of the early dietitian; she was known as the professional who would interpret the physician's dietary prescriptions (6,7,8). We see a movement, near the turn of the century, in which the concern of quality food service and nutritional care was shared by nurses, doctors, and dietitians.

The formalization of the ADA began during the first World War, when the Office of the Surgeon General appointed the first dietitian to his staff. It was at this time that functions of the dietitian began to be defined (5). In 1917, the ADA was organized for the purpose of formulating a plan for dietetic communications to determine how the dietitians best could meet the food problems of the day (5). Only 39 dietitians were charter members (5); today's roster of the ADA has increased over 1,000-fold (9), over 98% being female (10).

EDUCATIONAL REQUIREMENTS

Standards of performance and requirements for dietetic students and practicing dietitians were established early by leaders in the field, hospital administrators, and physicians (6,7,11,12,13). In 1926, the first formal requirements for ADA membership included a bachelor's degree from a recognized college or university plus an additional three-month apprenticeship in a hospital (14). This apprenticeship, currently called an "internship", was increased to one year. More recently, in an attempt to meet manpower demands for dietitians, some internships have been condensed to 6 or 9 months.

Because the increased demand for more dietitians could not be met by traditional qualifying methods, i.e., the internship or traineeship, the ADA Study Commission, a group designated to provide a review of the ADA, recommended condensing the program for membership (15). To provide an alternative to the

4-year academic plus apprenticeship type of program, the Commission suggested adoption of the previously piloted Coordinated Undergraduate Program (CUP). The CUP, which results in a baccalaureate degree after 4 years, is a program in which the final two years combine academic courses with clinical experiences. Another method for completing the ADA membership requirements is through specific advanced degrees plus supervised experience or documentation of approved professional practice. Academic requirements and competency expectations for qualification into the ADA include study of the physical, biological, behavioral, communicative, and food and nutritional sciences (16,17).

THE DIETITIAN

These educational approaches require careful planning to provide the academic background and practical experiences necessary for the dietetic student to become a team member with unique knowledge and skills in the food and nutritional sciences. Having completed this background, she meets the requirements to be called an **ADA Dietitian** which the ADA defines as, "a specialist educated for a profession responsible for the nutritional care of individuals and groups. Care includes the application of the science and art of human nutrition in helping people select and obtain food for the primary purpose of nourishing their bodies in health or disease throughout the life cycle (18)".

ADA dietitians have had an opportunity to be registered (R.D.) since 1969 following successful completion of an examination (19). To maintain registration, continuing education requirements must be completed (20).

Areas of specialization within dietetics that may be pursued include management, community, general, and clincial (16). Although the remainder of the text will be devoted to the clinical dietitian, it is important to mention the other dietetic specialties, management and community, for they "bridge the gap" in providing nutritional care. The management or administrative dietitian is responsible for management of the entire operations of the dietary department. Her responsibilities include the management of the food service systems, clinical dietetics, and educational programs in nutrition within the organization (18). The community dietitian works with an agency that is oriented to community health care. Her responsibilities include planning, coordinating, and evaluating the nutritional component of programs within the community (21). Many times, the community dietitian provides follow-up of patients who have been discharged from the hospital on a therapeutic regimen. These various dietetic specialists, along with the clinical dietitians, work in harmony for the purpose of fulfilling the responsibility of nutritional care to individuals and groups.

The Clinical Dietitian

The ADA has identified the **Clinical Dietitian** as one who "is a member of the health care team and affects the nutrtional care of individuals and groups for health maintenance. The clinical dietitian assesses nutritional needs, develops and implements nutritional care plans, and evaluates and reports these results appropriately (18)."

Within the specialty of clinical dietetics, there are several subspecialty areas, such as renal, pediatrics, genetics, metabolic support, and research.

The practicing clinical dietitian has a broad range of activities, from planning to implementation of the patient's nutritional care plan. She provides information and designs materials for use with patients, students, and other personnel. She must be an organizer, an interpreter of research information, and a competent communicator. She also must administer policies of departmental nature as well as ultimately be responsible to the patient for implementation of dietary prescriptions.

A study group of the ADA recently completed a report on "Role Delineation for the Field of Clinical Dietetics" that will assist in preparing the student for a beginning position in clinical dietetics (22).

I shall now elaborate on the clinical dietitian's role on the health team, as a member of the nutritional support team, as a nutritional counselor, and as an educator.

The Clinical Dietitian on the Health Team

Nutritional care rendered by the dietitian varies according to the particular health team of which she is a member. How the dietitian executes her responsibilities may result from how team members have perceived the dietitian's role, the dietitian's self-perception, and how she interacts in the work situation as a member of the team. The team response to inquiries about the dietitian's role is varied. Individually, physicians expected the dietitian to perform duties with high responsibility (23). Those physicians surveyed by the ADA Study Commission who were "involved in nutritional problems" accepted the dietitian's role as a "health professional"; those who were not, perceived her as a "management technician" (15). In other studies, physicians recognized the dietitian as a specialist in the knowledge of food composition and nutritional requirements with the ability to plan menus to please patients (24,25,26).

Physicians in two separate surveys thought dietitians should participate actively in such patient-related activities as providing dietary information to the physician and instucting patients on diets, yet some physicians in the same studies did not consider it necessary for the dietitian to understand reasons for the patient's non-compliance with the diet or to understand the psychological bases of diseases (24,25).

Administrators regarded dietitians as either managers of food service operations or professionals on the hospital staff with the responsibility to assist physicians in the total care of the physicians' patients (15). One hospital administrator considered the dietitian as a highly-skilled professional who would gain status from performance of a creditable job (27). Other professionals on the team viewed the dietitian as either a consultant for patient care or an expeditor of food service operations, but not as a team member (15).

Dietitians vary in the interpretation of their roles and responsibilities. A recent study of a group of dietitians who provided direct services to patients, including clinical dietitians, confirmed their performance of traditional roles and functions, e.g., offering nutritional consultation, instructing patients, providing information on food composition, and exercising professional ethics (28). Duties with high levels of responsibility reportedly were performed less often by dietitians, e.g., presenting seminars, making hospital rounds with physicians, and contributing to the patient's diagnosis. Commonly listed as major deterrents to performance of the high-responsibility roles were lack of time, hospital policies, and lack of education. The physician was less often listed as a barrier to the performance of the high-responsibility duties. These results are in agreement with results from the Schiller study in 1972 (24). Interestingly, a majority of the dietitians we surveyed indicated they performed as full and equal members of the team, though only a small minority performed high level decision-making functions (28).

The Clinical Dietitian on the Nutritional Support Team

A team has been developed recently to care for critically ill persons, the nutritional support team. In contrast to the description of the clinical dietitian above, the clinical dietitian on the nutritional support team has specific high-responsibility roles. She contributes substantially in the nutritional assessment and rehabilitation of the patient. An indication of the recognition of this role is her participation in the American Society for Parenteral and Enteral Nutrition (ASPEN). ASPEN was organized approximately 10 years ago for physicians, dietitians, nurses, pharmacists, and other support team members who work actively in the field of parenteral and enteral nutrition. This group has ongoing communications in an annual congress and a bimonthly journal for the purpose of promoting the application of clinical and research experiences in the practice of providing nutritionally sound care to patients receiving enteral and parenteral nutrition.

The Clinical Dietitian as Nutritional Counselor

A major function of the dietitian involves the counseling of patients as to food and its use. The Dietary Therapy Section of the ADA states that "proficiency in diet counseling is, or should be, a basic skill of the dietitian concerned with patient care (29)." The report defines dietary counseling as an individualized process, comprising the activities of interviewing, counseling, and consulting. The ADA committee also emphasized the need to understand the patient, "physiologically, psychologically, socially, and economically" (29).

Because of the diversity and complexity of influences that mold food habits, the dietitian must become proficient in the understanding of backgrounds and behaviors of individuals and appropriate methods to effect change. Whether the goal of the counseling session is therapy, health maintenance, or modification of food habits, the procedure is incomplete without an exploration of the patient's food intake and the pattern of his living habits that affect use of foods (30). Alterations in food intake are more acceptable to the patient if the counselor has insight into the basis for the beliefs and practices concerning food during health and illness (31-35).

Because the dietitian, like other health professionals, interrelates with patients during a significant portion of her time, a technique devoted to assess her skills in interviewing and counseling would appear beneficial. Basic to any such developmental effort, it might be well to recognize and establish the real purposes and value of the conseling interactions between dietitian and patient. Andrew (36) has stated that answers to such questions that examine the purposes, frequency, and settings of the sessions, as well as the impact of dietitian-patient interactions on the quality of health care provided should reveal the need and value of such an evaluative effort. Some of the questions proposed by Andrew were considered in our study of selected Texas dietitians.

We also inquired as to how the dietitian learned the process of counseling and the nature of her current practices related to counseling. Respondents indicated that they most often learned the theory and applicable guidelines of counseling in the clinical program in which they fulfilled qualification for ADA membership than from course work on the subject. They ranked with approximately equal importance three techniques as most useful for learning the skills of nutritional counseling: self-instruction through experience, observation of a dietitian, and supervision by a dietitian (28). From these results, it would seem that the dietetic student enters the clinical program for professional qualification without an academic background in counseling. It appears at best that the theory, guidelines, and skills of nutritional counseling have been presented in an informal, unstructured manner.

The majority of Texas dietitians that we studied reported that they generally had spent less than one-half of their work week with patients of which more than one-half was spent counseling patients. When the initial counseling session was related to the evaluation of food habits and/or diet modification, the session generally lasted 16 to 30 minutes; two was the average number of sessions. The number of dietitians did not influence either length of time spent or the number of sessions planned, but position category did. Community, clinic-type, and self-employed dietitians counseled longer and more frequently than did dietitians in other position categories such as the clinical dietitian (28).

The information from our investigation differs from the results of other studies (37-42). We found that a disparity in time allotment was related to differences in philosophies and/or policies guiding the dietitians. In some instances the dietitian interspersed counseling among other duties, such as hospital food service; in other situations, the dietitian's intended role was to counsel, as in private practice or in an educational center.

In our study of roles and functions relating to nutritional counseling (28), the initiation of the therapeutic nutritional counseling occurred more often in response to requests from team members (other than physician) than as a result of a decision made by the dietitian. A majority indicated they would provide nutritional counseling on short notice (less than an hour), implying a hurried approach to a serious task. This response exemplified problems brought to light in a discussion before the U.S. Senate Select Committee. In the report it was recognized that in many instances dietitians were asked routinely to give dietary instructions at the last minute (43), a practice that is a deterrent to an adequate and effective presentation.

In our studies, only a small minority of dietitians (private practice excluded) provided nutritional counseling for a fee (28). Perhaps because the dietitian's counseling services usually have been provided without a fee, these duties have not been perceived as equal to income-producing services.

The counseling session provided the dietitian the opportunity for many types of dietitian-patient interactions (28). The majority used the session to motivate the patient, to provide dietary instructions, to provide dietary counsel to the patient and family members, and to seek reasons for failure to follow the diet. During the interview sessions, the majority of the respondents indicated they: related instruction to the availability of food and economic resources, responded to the patient's sociocultural attitudes to foods, determined the patient's attitude to foods in health and illness, and involved the food decision maker in the counseling sessions. Only a minority provided follow-up for evaluation and reinforcement of the diet or evaluation of the patient's comprehension of the previous session in a measurable, recorded form. Although it was found that almost 82% of the dietitians indicated that they devoted as much time as required for the patient to understand the diet modification, the time they reported spending with the patient (16 to 30 minutes and usually 2 sessions) seemed less than adequate.

There was generally a lack of priorities given nutritional counseling. This could be attributed to the informal manner in which the dietitian was provided guidelines of nutritional counseling, thus preventing her from perceiving it as a process requiring professional skills and adequate time. Dietitians within hospital settings work within priorities set by administrative guidelines, with much of their time directed to matters other than direct patient care, such as hospital food service. It may be impossible to devote more time to nutritional counseling. It would appear that if nutritional counseling were an income-producing service, more time could be allocated to this function which is related more to home care. An alternative solution would be that in which dietitians in out-patient clinics or community settings would be available to provide long-term follow-up to patients for better understanding of the therapeutic alterations.

The Clinical Dietitian as Educator

The teaching clinical dietitian, the person with whom most of you work, is a faculty member in a variety of health professional schools. In addition to her clinical description, the **Teaching Dietitian** is described by the ADA as one "with advanced preparation in dietetics or education; plans, conducts, and evaluates educational programs in one or more dietetic subject areas" (18). Her responsibilities and duties vary in relation to the health professional school in which she is employed. I would like to share with you, from my experiences in a medical school, the evolution of our educational program and of my experiences.

The nutritional education facilities at Baylor College of Medicine are located in the Department of Pediatrics, Section of Nutrition and Gastroenterology. The program evolved because of the foresight of Dr. Buford Nichols, who projected that nutrition should be a visible component in the medical care of patients, and that nutrition should be included in the medical school curriculum.

We developed our program based on the premise that the course approach must be tailored to the facility. Approximately 12 years ago, the students requested a course in the basic science of nutrition. Faculty members from various disciplines of basic and clinical sciences shared in the presentation of lectures for this course. Clinical electives in nutrition have been offered since 1965. One of our most popular electives is the clinical clerkship in pediatric nutrition, in which the students focus on the relationship of nutrition to patient care. Students from other medical schools participate in this elective, including the awardees of the American Medical Association's Joseph Goldberger scholarship in Clinical Nutrition.

Because our hospital affiliations are varied, the medical students have an opportunity to observe and work with other dietitians, mainly clinical and community, in the affiliated hospitals and throughout the hospital district. From this variety of settings the medical students see patients from all sociocultural and economic groups.

Five years ago, we conducted a survey at Baylor College of Medicine by interviewing all departmental chairpersons and key faculty members to identify nutritional material being taught to medical students in the basic and clinical sciences curriculum. From this information, we defined the educational objectives for our nutritional program. Currently the major portion of the 18-hour integrated nutrition curriculum is devoted to the study of nutrient physiology. Most of the lectures are given within the Physiology course, but others are given in the Pathology and Introduction to Disease courses.

In 1976-1978, we were fortunate to have a Health Professions Grant from the former DHEW. This enabled us to add a physician/nutritional biochemist to our staff, Dr. Cutberto Garza, whom many of you know. Thus, the core team for teaching nutrition in a medical school setting, as defined at the Williamsburg Conference, was complete with Dr. Nichols, the clinician; Dr. Garza, the physician/nutritional biochemist; and myself, the dietitian.

Over the years, other dimensions have been added to our nutritional program at Baylor College of Medicine. The postdoctoral fellowship program was developed to provide pediatricians an opportunity to specialize in nutrition and gastroenterology. The program is designed to provide opportunities for academic responsibilities, independent and original research, and most importantly, clinical services to patients. At the completion of the program, the graduates are expected to successfully complete the examination of the American Board of Nutrition.

More recently, the Children's Nutrition Research Center was established at Baylor College of Medicine in conjunction with the Section of Nutrition and Gastroenterology of the Department of Pediatrics. The Children's Nutrition Research Center is one of the four human nutrition centers established by the Department of Agriculture/Agricultural Research Service. The primary mission of the Center is to determine nutritional requirements of pregnant and lactating women and infants and children from conception through adolescence. By expanding our group of scientists, we have increased faculty representation and greater research opportunities for fellows and medical students.

My role as an educator includes as a major function, the coordination and evaluation of the content of all areas of the general medial student curriculum related to nutrition. Also included is the responsibility to coordinate nutrition electives and teach such topics as the interpretation of nutritional assessment techniques, particularly dietary analysis; sociocultural aspects of food intake; therapeutic nutrition, development of infant feeding practices; and patient cooperation/compliance.

My clinical responsibilities include participation as the Nutritionist in the Nutrition and GI clinics, the Genetic-Metabolic clinics, and as a nutritional consultant to specialty cases of hospitalized patients. These experiences provide an opportunity for my participation in rounds and conferences related to patient care.

CONCLUSIONS

Many of us are fortunate to work in settings in which team members not only perceive the role of the clinical dietitian as significant in health care, but also cooperate in assigning that role equal status. Concern remains, however, as to whether all clinical dietitians are provided the opportunity to perform the responsibilities and functions for which they have been prepared.

There is general agreement that the dietitian should be delegated the responsibility of nutritional counseling. However, unless a dietitian is employed in a clinic setting or patient-educational center, very little of her work week is devoted to the task of nutritional counseling. The seemingly low priority assignment may be the result of her limited or informal education in nutritional counseling, other priorities assigned by the specific health care setting, or lack of compensation to the hospital or agency by which she is employed.

In view of the escalating costs of health care and the resultant effort to curb such increases, it behooves health professionals to examine the efficiency of role assignments within the health care setting. The time seems for health professional groups, and particularly the profession of dietetics, to have studies conducted to determine the actual role of the dietitian within the health care setting. Experts in group dynamics; in the analysis of job description, job preparedness, and job performance; and in task assignments should be called upon to conduct such a study. Professionals external to the field of dietetics, such as medical sociologists and cultural anthropologists, could assist in this study. Upon completion, the educator would have a more realistic format for teaching in the field of dietetics, and preparing the dietitian for her role in nutritional care.

As educators, we must prepare professionals who dream, but with realistic expectations. We must prepare the dietitian to distinguish professional responsibilities from those tasks that do not require professional skills.

The future of the profession of dietetics is based on our ability to provide nutritional care to patients and information to other health professionals. That third team member of the Williamsburg nutritional core team, the dietitian, deserves to be prepared to conduct her professional responsibilities of nutritional care with a high degree of expertise.

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ACKNOWLEDGEMENT

This work is a publication of the USDA/ARS, Children's Nutrition Research Center, Department of Pediatrics, Baylor College of Medicine and Texas Children's Hospital.

NUTRITION EDUCATION: THE AMERICAN MEDICAL ASSOCIATION PERSPECTIVE

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Re-printed with permission of John Libbey & Company Limited. London. *Recent Advances in Clinical Nutrition, I.*

Published as: Nutrition in the Medical Curriculum: An American Perspective,
By Philip L. White, M.S., Sc.D. and Constance J. Geiger, M.S., R.D.

Nutrition teaching in undergraduate medical education is much studied, little understood and often criticized.[1-5] The American Medical Association (AMA) has been involved in efforts to improve nutrition teaching for many decades.[6] James. S. McLester, M.D., Chairman of the AMA Council on Foods and Nutrition in 1946 told the Council, "Teaching has not kept pace with the advancement of knowledge in the science of nutrition." He admonished the Council to promote the teaching of nutrition in medical schools and hospitals. Dr. McLester joined Drs. Russell Wilder and John B. Youmans in objecting to the segregation of nutrition in a narrowly defined discipline (written communication, Bulletin of the Council on Foods and Nutrition, 1946).

The Council on Foods and Nutrition through the next 29 years of its existence conducted vigorous programs of education in nutrition. Two significant conferences held in 1962[1] and in 1972[3] contributed greatly to the advances now being realized. Surveys of nutrition teaching in American medical schools by the AMA Department of Foods and Nutrition (DFN) and others have provided useful information.[7-11] The Department serves as a clearing house of information on course and curriculum design.

In recent years, as nutrition has become a public policy issue, considerable attention has been given to the training physicians receive in nutrition. Hearings held by the U.S. congress and other federal agencies have focused attention on strengths and weaknesses as well as potential remedial actions, much of the testimony has been critical and pessimistic in nature.[12-14] Disappointment with the apparent delay in augmenting nutrition teaching is a common thread. The overall impression from criticism during the past few years is that medical school curricula easily should be able to accomodate one or more required courses on nutrition. There is temptation to believe that unless a subject is listed in the course catalog, it is not taught at all. Medical schools, the American Medical Association, the American Association of Medical Colleges, and the National Board of Medical Examiners have been criticized for failing to give primary emphasis to nutrition.[12,13] The criticism is not wholly justified.

Medical Education. — An understanding of complexities of curriculum design and of the very process of medical education and its sustenance is necessary if one is to exert influence for change. Some background on the constraints on medical curricula in the United States may help to place nutrition education in a useful context. Each of the 129 medical schools is unique. Each has its own structure and spirit, shaped over the years by the Deans, the corporate faculty and its individual members, the curriculum committee, the student body, residents in training and the environment in which the school is located. While schools may hear the drumbeat of the national board examinations, not all schools march to its beat. This refers to the suggestion that if national board examinations included additional questions on nutritional topics, the schools would be motivated to enhance their teaching in order to accommodate the graduating student at examination time.

Deans and curriculum committees continually receive petitions for more curriculum time for conventional courses. Nutrition is but one of the interdisciplinary conjoint sub-specialties for which time is sought on the crowded academic schedule; often one gains the impression that the curriculum is in constant turmoil.

Time and money to support the necessary teaching faculty are generally major problems when additional material is to be inserted into the curriculum. Modest amounts of money for nutrition have become available through such agencies as the Health Resources Administration and National Institutes of Health (NIH) of the Department of Health and Human Services (DHHS) and the Metropolitan Life Insurance Company Nutrition Awards Program.

Not many new programs can be funded among the 129 medical schools needing support. According to a letter from William J. Darby, M.D., Ph.D. in 1978, it is estimated that a chair in a U.S. medical school requires an endowment of at least $1,000,000 to support it.

Elimination of the year for internship study has placed extra burdens on both undergraduate and gradute education. To an extent, more clinical experience has been crammed into the curriculum, compounding scheduling problems and effectively reducing time for didactics. Demands are now being made on residency training programs to provide one or two years of rotating internships. There also appears to be a trend to alter the overall style of a medical curriculum about every seven years. The most recent example is the trend to shorten and then to lengthen the time for completion of undergraduate medical education. This trend began in the early 1970s when some medical schools changed from a 4-year to a 3-year continuous curriculum and now are reverting to the four-year cycle. Preliminary results from our 1980 survey of nutrition teaching in medical education suggest that time in the schedule for teaching nutrition is being lost when a school goes from a three- to a four-year curriculum. One would expect the reverse to be true.

Medical schools wishing to introduce new emphasis in nutrition often encounter considerable difficulty locating qualified faculty members to serve as nutrition coordinators. There is a current shortage of experienced clinicians, qualified by special training, who are interested in and prepared to teach nutrition. Many recommendations have been made for programs to prepare the teachers.[1-3,15] Training support is now being provided through such programs as The National Program in Clinical Nutrition Research Units, Individual Fellowships, and Institutional Training Grants all funded by NIH of DHHS.

Since nutrition intersects with each of the medical specialties, a nutrition coordinator must work comfortably with essentially all of the teaching faculty. This interaction is generally most productive when the coordinator has a direct connection with the Office of the Dean. One program that exemplifies an administrative breakthrough may be found in California. For a number of years a nutrition curriculum committee prepared reports documenting the need for nutrition in the clinical and preclinical curricula. Medical students supported the effort; the administration took no action. Subsequently, the administration hired a professor to coordinate a nutrition program within the medical school's existing resources. The coordinator was positioned as an associate Dean in order to provide authority. Time was given in biochemistry for the teaching of nutrition.

Prior to the coordinator's arrival, the nutrition component consisted of one "trial" elective course and six hours of lecture in biochemistry. In the first year, time in biochemistry was increased to eight hours and a permanent elective in nutrition was created. During the second year, 12 hours of nutrition were taught in biochemistry and clinical and pre-clinical electives in nutrition were added. Nutrition was incorporated into five other core courses. Within the next two years, an Interdisciplinary Nutrition Education Grant was obtained from the government; the school is now working closely with the faculty in the schools of Dentistry, Pharmacy and Nursing to develop joint programming in nutrition. Successful integration of nutrition topics has occurred throughout the curriculum. The electives have remained with an increase in student participation. (Personal communication — Marion Nestle, Ph.D. in a conversation, June 1980.)

Current Status of Nutrition Teaching. — The curricula of U.S medical schools, although differing in format, are essentially similar. The first half of the three or four-year curriculum is concerned with the basic medical sciences, i.e., biochemistry, physiology, anatomy, etc. and with pathophysiology and manifestations of disease. The second half of the curriculum is concerned with integrated clinical medicine with major emphasis on clinical clerkships.

The American Medical Association through its Council on Foods and Nutrition and now the Department of Foods and Nutrition has encouraged the improvement of nutrition teaching for many years. Although not the first, perhaps the most significant stimulus came from the report of the 1962 Chicopee Conference on Nutrition Teaching in Medical Education.[1] This conference, a few smaller intervening conferences held by AMA, and finally The Williamsburg Conference in 1972[3] largely defined the body of knowledge for which a graduating student should be responsible. These reports have helped to shape the present course of nutrition in medical education. The DFN also sponsored the AMA Visiting Professors in Clinical Nutrition from 1964 to 1978. The purpose of the program was to place outstanding researchers and educators on 30 medical school campuses per year for grand rounds, lectures and conferences. The professors provided a focus for nutrition and served to stimulate nutrition curriculum development.

Many means exist to assess progress, not the least of which is the biennial survey carried out by our Department. Between 1976 and 1978,[9] sixty medical schools added courses in nutrition to their curriculum, in most cases expanding an existing nutrition component. Required courses in nutrition increased by 32% with a total of 30 medical schools offering a course identified, **per se**, as nutrition. Usually, these particular courses were given during the basic science years with some medical schools providing a second, required course during the clinical years. Most courses were about 20 hours in length and presented the concepts of normal as well as therapeutic nutrition. The majority of electives in nutrition were offered as interdisciplinary courses; 84 schools provided such opportunities. The integration of nutrition throughout the medical school curriculum was reported as the most popular approach. The 1978 survey revealed that 97% of the medical schools utilized the integrated approach, with nutrition being incorporated into as many as 30 different courses and clinical clerkships.

Perhaps the best illustration of the positive gains can be found in our experience with clinical clerkships in nutrition. Beginning in 1957 the Goldberger Medical Student Research Fellowships through the next eighteen years provided the opportunity for 206 students to participate in some form of clinical research in nutrition. Many were stimulated to specialize in clinical nutrition as the result of their experiences; all gained respect for nutrition as a component of medical research. In 1975, the research fellowships were changed to clinical nutrition scholarships. This provided medical students with the opportunity to apply nutrition in medical practice when their own school did not offer such an experience. At that time we could identify six or eight medical schools with the capability of providing clerkships in clinical nutrition and prevailed upon them to accept our 18 scholars. Within one year, twenty-seven schools announced the availability of nutrition clerkship electives.[8] The number grew to 43 in 1978[9] and this year we can identify 62 schools with such elective courses. This rapid development obviously reflects an awareness of the importance of nutrition in medical practice. The future appears to be bright. Sustaining interest will require appropriate finances, the availability of centers of competence to prepare outstanding teachers, and the availability of relevant clinical examples for learning experiences.

Education Stimulus. — Two recent developments that have provided much needed stimulation to nutrition in medical education have been (1) the advances in the use of total parenteral and enteral nutrition to sustain patients who are seriously ill and (2) documentation that a properly nourished patient is a better surgical risk and is likely to be therapeutically more responsive.[16] Now, in addition to learning about nutrition and human development, the classical vitamin deficiencies, and the management of diabetes and other disorders requiring special dietary management, students are learning to appreciate the relationships between nutritional status and response to disease and trauma. The "metabolic management" of the critically ill patient offers unlimited challenges to medical research. Nutrition, as one aspect of this research, has become a clinically viable discipline in those medical schools that appreciate its importance; nearly always the stimulus comes from the departments of surgery and medicine.

The medical students, themselves, have provided stimulus for additional and superior course work in nutrition. Entering students, not convinced that the subject is given appropriate attention, will petition for courses or better integration of nutrition. Schools usually respond positively, but unless appropriate clinical correlation is provided in later years, students become distracted with other aspects of medicine and soon lose interest. (Personal communication with A. French, M.D., in a conversation, November 1978) Nevertheless, student demands have stimulated the improvement of nutrition teaching in a number of schools.

We must mention in passing two other developments that have captivated the interest of a number of federal agencies and stimulated their support nutrition education. The first is the revelation of so-called "hospital malnutrition" that shocked the medical community. The second development is the recent heightened interest in the possible role of diet in the etiology of certain chronic, degenerative diseases. Uncomfortable with the thought that physicians may not be paying appropriate attention to nutrition in preventive medicine, congressional committees, The National Cancer Institute, and a number of governmental advisory agencies have challenged schools of medicine to augment their treatment of the subject.[11,17-20]

Quality in Teaching. — The quality and, thus, the success of nutrition teaching in any given school depends upon several individual factors. Expertise in nutrition among the clinical science faculty is essential. When strength in nutrition can be found in two or more clinical specialties, the students are more liable to receive appropriate instruction and put their knowledge to use. Medicine and surgery are the two specialties that provide a strong interface. Pediatrics and community or preventive medicice, although the major focus for nutrition in many medical schools, can not give a strong identity for a entire faculty.

Biochemistry, among the basic science disciplines, always has had identification with nutrition. Biochemistry and physiology, basic components of a sound program in clinical nutrition, can not, **per se**, sustain nutrition in medical education unless there is a strong commitment to clinical correlations and interaction with clinical departments. Clinical correlation and "hands on" application following a sound basic training is the only successful formula.

Active research programs that relate to nutrition are a necessary component of strong interest in and ability to teach nutrition. Research involvement, of course, is a basic tenet of any good medical school faculty, but it is unlikely that a school not known for research productivity in nutrition will be able to provide scholarly leadership in nutrition education.

Schools affiliated with medical centers that provide special services, such as a major burn center, a unit for the management of genetic abnormalities, or a nutrition or metabolic support service, will usually provide a strong emphasis in clinical nutrition training.

Successful programs in nutrition that illustrate the ingredients necessary for quality teaching have been described in the literature.[21-24]

Several innovative teaching techniques have been introduced to strengthen nutrition teaching. The concept of the therapeutic diet conference was described by Lewis in 1948.[25] Harlan, **et al**,[26] expanded the concept and it has become a popular teaching technique in American medical schools. While on their clinical rotations, medical students are served commonly prescribed therapeutic diets to give them first hand experience with their appearance and taste. Lectures or seminars are given at the same time to further define the role of dietary modification in medical practice.

The Nutrition Foundation, Inc.* has published useful nutrition education materials: (1) "Selected Nutrition Reference Texts for Physicians and Medical Students"; (2) "Education in Nutrition for Physicians and Dentists: An Annotated Bibliography"; and (3) "Nutrition Education in the Medical School: A Curriculum Design" by Reva T. Frankle, Ed.D., R.D.

The U.S. Department of Health and Human Services has supported nutrition teaching materials development: (1) Forty-five self-instructional monographs for medical and allied medical education — The University of North Carolina; (2) Sixteen modules for family practice residents — The Ohio State University; and (3) Two video-taped case histories depicting nutrition problems throughout the life cycle for medical students — The University of Oklahoma.

The development of audio-visual materials and accompanying monographs by industry and various foundations has accompanied the increased interest in nutrition.

Weaknesses in Nutrition Teaching. — Some lessons can be learned from the experiences of medical schools that have lost or seem to be losing ground in the battle to maintain or to increase emphasis in nutrition. The one-man-show will succeed only as long as that person can maintain the base of influence. Loss of research or teaching grants, inability to maintain curricular relevance, or a change in faculty, can bring down the nutrition component of a one-man-show like a tumbling house of cards. Lack of interdisciplinary strength and cooperation is often a forewarning of difficulty to come in the continuing struggle for curriculum time.

Obviously, new ventures usually begin by the assignment of someone to initiate the venture; so it is with nutrition in medical education. The relative shortage of physicians trained in clinical nutrition is a decided handicap for the medical school searching for a nutrition coordinator. Once found, that nutrition specialist must establish a base of influence and interdisciplinary strength in order to obtain time in the curriculum or to assure that nutrition is taught throughout the curriculum whenever and wherever appropriate. Perhaps the most important function is to help assure clinical reinforcement and application of nutrition concepts. This is one reason why nutrition support services can play an important role in medical education, i.e., direct and visible clinical demonstration of the value of nutrition in medical care.[27,28]

Conclusion. — Several techniques have been employed to assess the quality of undergraduate nutrition education: (1) In-depth studies of a few medical schools;[10,29] (2) Evaluation of national board examinations for those questions related to nutrition;[30] (3) Documentation of the treatment given to nutrition in the "standard medical textbooks;[31] (4) Examination of medical students to determine the depth of their knowledge in nutrition;[32,33] and (5) Review of medical school course catalogs to ascertain by course title and outline whether nutrition is included in the curriculum.[34] All of these approaches require care in the interpretation of their significance. It is easy to lose sight of the fact that a graduating medical student is not a finished product. One can not judge the body of knowledge accumulated by the student through evaluation of educational requirements to be met. Ancillary study and the pursuit of special interest electives are important parts of the educational process; much nutrition is learned in this manner but the casual observer of medical education may not be aware of these aspects of learning.

Critics of nutrition education cite the paucity of required courses, implying that no nutrition is taught when discreet courses are absent from the curriculum. Critics usually urge the scheduling of required clinical coursework in nutrition. There are a number of difficulties with the recommendation, at least in American medical school scheduling. The clinical components of the third year and part of the fourth year usually consist of required clerkships in medicine, surgery, pediatrics, obstetrics and gynecology, psychiatry, neurology and family practice. The remainder of the fourth year is composed of elective clerkships. Once the hospital-based clerkships begin in the third year, students are seldom assembled for didactic lecture courses. Most often teaching is accomplished in hospital rounds, conferences, seminars and special studies.

The integration of nutrition into the framework of other courses is the norm. This has been illustrated by earlier revelation that nutrition often is treated as an integral part of many generic courses. A nutrition coordinating committee can be very influential in the integration process. Because the coordination crosses many departmental lines, the base of authority of the committee is quite important.

There is no preferred method to teach nutrition in undergraduate medical education. There is agreement that clinical emphasis is essential if students are to sustain their interest and become lifetime learners. Realistically, integrated teaching of the subject coordinated throughout the curricula with strong clinical correlations may be the most effective way to teach nutrition.

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ADDENDUM

The aforegoing paper was presented at a symposium, **Training in Clinical Nutrition**, held in 1980 as part of an international symposium on clinical nutrition.[1] The only change was the verbal insertion of data from the 1980 survey of the teaching of nutrition in U.S. medical schools. This material will be the subject of a forthcoming article under separate publication.

The several papers presented at the 1980 symposium compared experiences in nutrition teaching in medical education in four countries: the United States, Sweden, France and Australia. The similarities far outnumbered the disparities. A large number of useful recommendations and observations emerged from the symposium. I will review the appropriate examples.

What should medical students be taught in nutrition is a frequent question. The question is usually asked by those who have been given the responsibility to teach or coordinate a new or revised course, but who, in turn have not received primary training in clinical nutrition. In this regard, Dr. George Bray in his presentation at the London symposium reviewed the results of an indepth study of the teaching of nutrition at four U.S medical schools.[2] None of the schools appeared to place high priority on nutrition or to have a clinical nutritionist providing a primary focus. All four schools had one or more dietitians/nutritionists but none had succeeded in providing the needed focus. Bray concluded: ". . . While some nutrition appears to be taught in medical schools, strengthening of the nutrition curriculum is necessary. One reasonable and logical way to do this would be for each school to engage a physician as a focal point for nutrition, to pull nutrition training together so that any weakness in the teaching could be identified. This focal point should be placed in an existing department in the medical school and should be a physician with a special interest and capability in nutrition, available for teaching and research." (2 pp 267-268)

Bray included a number of other observations in his presentation:

(1) There is need for a primary focus on nutrition that prevails throughout the medical school and the curriculum;

(2) Early "exposure" to nutrition without follow-up or reinforcement is probably of little value in orienting the medical student;

(3) Clinical emphasis is more lasting than is chemical (a biochemical) emphasis in nutriton'

(4) Elective courses that reach 10 to 20 percent of the students can not serve as the primary emphasis on nutrition;

(5) Board examinations that include appropriate questions on nutrition can serve as an influence on medical schools to teach nutrition and on students to learn;

(6) Major weaknesses found in evaluations of students' and physicians' facility with nutrition are: the taking and interpreting of the diet history, the assessment of nutritional status of patients, and counselling patients regarding diet;

(7) A physician who has not received training in nutrition may overlook his patient's nourishment and not realize that malnutrition is developing. This is a common concern of al who have discoursed on hospital malnutrition.

The differences between training a clinical nutritionist and training a physician in clinical nutrition were reviewed by Isaksson and Bosaeus.[3] They were skeptical of the value of a physician trained to specialize only in nutrition. Beyond teaching or research, the career opportunities are limited. Instead, the Swedish experience favors the physician who, in addition to training in a basic medical specialty, has had a good education in nutrition. This subtly differs from Van Itallie's recommendation that "organ-oriented physicians" supplement their speciality with a certain training in clinical nutrition so that they will be able to handle their own patients' nutritional problems.[4] Van Itallie calls them "hyphenated" specialists. Where, asks Isaksson, would such organ-oriented nutrition training be obtained? Instead, the recommendation is for an independent nutrition unit within the hospital, a Department of Clinical Nutrition, to "oversee" nutrition and to be available for special services, e.g., a nutritional support unit.

The University of Gothenburg has such a department that is involved in research, undergraduate teaching, training clinical nutritionists and physicians, basic care, diagnostic procedures (assessment of nutritonal status), metabolic wards and nutrition support services. The training program leading to competence in clinical nutrition in Sweden requires a total of 13 years to complete. In addition to 5.5 years in basic medical studies, 2 years in general medical service, and 4 years of specialization, 1.5 years are required in clinical nutrition. Thus, competence in clinical nutrition culminates a rigorous clinical training in one or more clinical specialities. In keeping with the often repeated plea for superbly trained physicians with special competence in clinical nutrition to serve as coordinators of foci for the teaching of nutrition, a Swedish trained physician should fit the bill.

Isaksson states the coordinator's obligation: to develop an awareness of the science of nutrition among medical students and colleagues, and make them aware that it can be of daily use in their practice and in the hospital.

Robert Olson in his presentation reiterated that theme as well.[5] The medical student must be strongly motivated early in order to kindle and maintain the flame throughout his education. St. Louis Univeristy School of Medicine carried out a special study of the nutrition information presented in the basic and clinical courses. An enormous amount of nutrition material was covered, yet "no medical student, when he finished, realized he had had any instruction in clinical nutrition." "He did not identify nutritional material with the subject of 'nutrition.' He did not have an attitude about nutrition in medical practice." Efforts to dramatize nutrition at rounds and conferences, and in tutorial teaching of small gorups on the wards were not effective. Finally a required course was devised for the end of the first year. Students completing the course were found to have a nutrition knowledge about equal to that found in the fourth year student. The ideas is that nutrition concepts, instilled as the student makes the transition from the basic science courses to the clinical courses, will stay with the student through medical school into practice. This experience is similar to that reported by Dr. Robert Shank at Washington University in St. Louis, who found that emphasis on nutrition in the course on pathophysiology at the end of the second year paid huge dividends (Personal Communication, R. Shank 1972).

Dr. Olson emphasized the need for an identified unit in nutrition in each medical school. He does not insist on a Chair of nutrition, but does insist that wherever located, the unit must have a clinical identification. It must have some physical and academic identification and a leader who is the model for the specialty practice in clinical nutrition. There must be research, teaching and consultation. In his discussion, Dr. Olson devoted considerable attention to what should be taught and how best to teach it. The references cited[3] can be a valuable addition to the library of the nutrition coordinator.

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ISSUES ON NUTRITION EDUCATION

Participant Work Groups

The National Workshop on Nutrition Education in Health Professional Schools was organized not only to share information concerning nutrition education in medical schools with the participants, but also to provide an opportunity for attendees to share experiences and ideas with each other. The participants were divided into five small groups of approximately twenty-five members each. Two sessions of the workshop were devoted to the participant work group discussions. Each of the five groups were provided a leader and a recorder. The following objective was provided each group.

Work Group Objective

> To obtain suggestions and recommendations from all attendees for the improvement of nutrition education in medical schools.

The sessions were directed at several discussion questions. These questions by session were as follows:

Discussion Issues

September 30, 1981

1. What are the most important obstacles to providing nutrition education for physician candidates? List in order of priority.
2. Should medical schools center their nutrition instruction on therapeutic nutrition? If so, why? If not where should the curriculum in nutrition be focused?
3. Should the role of the physician be different in nutritional care than for other health care situations? If so, how? If not, why?
4. Should the physician candidate be trained in working with interdisciplinary teams in nutritional care? If so, how? If not, what type of training should the physician receive to best utilize other health professionals in nutritional care?
5. Should applied nutrition be made a part of the basic science courses in medical education? If so, should the course be required? If not, when should a physician candidate be provided experiences in applied nutrition.

October 1, 1981

6. What is the responsibility of medical schools in helping physicians deal with nutritional quackery?
7. How does one go about getting nutrition education introduced as an important element in the education of physicians?
8. Who should be responsible for introducing nutrition education into the medical school curriculum?
9. How can nutrition education in medical schools best be funded? Should this be a priority area for federal funding in medical schools?

The following is a list of recommendations, suggestions, and comments of the attendees on each of the discussions issues:

Question No. 1. What are the most important obstacles to providing nutrition education for physician candidates? List in order of priority. These segments are not listed in priority order.

The need for role models in clinical nutrition.

The need for recognition by the institution.

Lack of time in the medical school curriculum.

Attitude of staff and students toward nutrition.

The need for clinical application of applied nutrition.

Financial provision of nutrition education.

Re-inventing the wheel constantly in nutrition education.

Lack of clinical nutrition faculty.

Lack of departmentalization of nutrition in the school of medicine.

Lack of nutrition education identity.

Elements of nutrition are a duplication of other areas in curriculum.

Lack of medical audit team concerned with nutrition.

Nutrition is seen as a "soft core" subject.

Determining content and level of nutrition education.

Marketing nutrition.

No financial gain for physician to practice nutrition.

Agreement in medical school curriculum committees.

Lack of support by administrators.

Nutrition is not a sub-specialty in medical practice.

Lack of data to support nutrition.

No clearinghouse for nutrition education.

Question No. 2. Should medical schools center their nutrition instruction on therapeutic nutrition? If so, why? If not, where should the curriculum in nutrition be focused?

Human nutrition with a therapeutic thrust. (Applied or clinical preferred.)

Therapeutic nutrition has dramatic potential for students.

Clinical nutrition may be thrust but must include all three — preventative, normal and therapeutic.

Therapeutic nutrition is necessary for merchandising to medical students.

Content depends on where the student is.

Curriculum should provide the basics in nutrition throughout the medical school.

Clinical should be emphasized in clinical years.

Question No. 3. Should the role of the physician be different in nutritional care than for other health care situations? If so, how? If not, why?

Physician should assume same role in nutrition as any other area.

Must be able to handle the situation or know when and how to refer to another health professional.

Physician is legally responsible for the health care of patient and should assume this role in nutritional care.

Question No. 4. Should the physician candidate be trained in working with interdisciplinary teams in nutritional care? If so, how? If not, what type of training should the physician receive to best utilize other health professionals in nutrition care?

The physician should be trained to work with interdisciplinary teams.

Physicians are not trained in this manner but on an individual practice basis.

Everyone believes in teams; few practice such.

Medical students should be made to feel a part of this team.

If team is not available, the medical student needs to know how to refer in nutrition.

Good team models need to be developed.

Question No. 5. Should applied nutrition be made a part of the basic science courses in medical education? If so, should this course be required? If not, when should a physician candidate be provided experiences in applied nutrition?

Nutrition should be a required course.

Nutrition should also be a part of basic science.

The course should attempt to make the student understand the usefulness of nutrition in later practice.

Question No. 6. What is the responsibility of medical schools in helping physicians deal with nutritional quackery?

Agreement that there is a responsiblity.

Students should be exposed to quackery in an objective way, without making the quacks look good.

Medical schools also have to be concerned with law suits against them for speaking out against things like health foods, etc.

Medical schools are responsible for quality medical education. They are also responsible for teaching quality nutrition education.

Medical schools should be responsible for exposing and covering quackery and for showing students the evidence for or against fads in nutrition.

Subtle academic approach is best. An overt attack on quackery is not necessary.

Medical schools should teach the scientific method for comparing various nutrition approaches.

Medical schools should establish credibility in nutrition and become a source for correct nutritional practice.

The nutrition education of local practicing physicians is necessary to combat quackery.

Medical school might provide a clearing house for legitimate sources of nutritional information.

Question No. 7. How does one go about getting nutrition education introduced as an important element in the education of physicians?

An awareness of the importance of nutrition must be created.

Clinical relevance is very important in initiating any subject in medical schools.

There is too much material currently in the curriculum for the first two years; therefore, one must look at entire curriculum when introducing nutrition in medical education.

One must state how nutrition relates to all other courses in the curriculum.

Additional funds are needed to introduce nutrition in any large scale manner.

A leader or coordinator of nutrition needs to be identified in each medical school.

A dynamic role model in nutrition is needed for medical students.

Physicians who are currently practicing sound nutrition should be used to create credibility in the medical school.

Current invervention techniques should be promoted.

One should focus on current issues that the consumer, community organizations, and federal programs are supporting. i.e., geriatrics.

One should document student interest.

Establish a student advocacy group that will approach the dean of curriculum.

The cost effectiveness of successful nutrition education programs should be documented.

Question No. 8. Who should be responsible for introducing nutrition education into the medical school curriculum?

The medical school curriculum committee should have the major responsibility.

The responsiblity will vary by school. The dean has the greatest responsiblity.

There is no absolute answer. It is relative to the resources within the medical school which should be carefully identified.

The individual introducing nutrition into the curriculum should be closely allied with a nutritionist.

The medical school faculty should share the responsiblity.

Without the support of the administration, no program will be successful for a long period of time.

Question No. 9. How can nutrition education in medical schools best be funded? Should this be a priority area for federal funding in medical schools?

The individual institutions should support the teaching of nutrition in medical school.

The administration should make the commitment to nutrition education.

Federal funds should be designated for nutrition research and clinical nutrition practice.

States should provide funding earmarked for nutrition education.

Federal funds should only provide and establish momentum.

Industry and private funding should be sought.

Summary of the Participant Work Groups

During the last participant work group session, a report to the total attendees was made by a representative of each of the five participant work groups. The comments made by the representative are covered in the above listing of comments and suggestions by question.

The group leaders and recorders are listed as follows:

Group A - Leader: Mary Lo Verde, M.S., R.D.,
University of Colorado Health
Sciences Center
Recorder: Jana K. Argo, M.M.Sc.,
R.D., Emory Univeristy School of
Medicine

Group B - Leader: William B. Batemen, M.D.,
Montifiore Hospital Residency
Program in Social Medicine
Recorder: Mary T. Taussig, M.M.Sc.,
R.D., Emory University School of
Medicine

Group C - Leader: Malcolm Berenson, M.D.,
University of Utah College of
Medicine
Recorder: Rita Thomas, Ph.D., R.D.,
University of Utah College of
Medicine

Group D - Leader: Marion Nestle, Ph.D.,
University of California, San
Francisco, School of Medicine
Recorder: Polly A. Fitz, M.A., R.D.,
Univeristy of Connecticut, School of
Allied Health Professions

Group E - Leader: Suzanne Gentner, R.D.,
Montefiore Hospital Residency
Progam in Social Medicine
Recorder: Wanda Hain, M.S., R.D.,
University of Pennsylvania, School
of Medicine

NUTRITION: FACT OR FICTION

Robert E. Olson, M.D., Ph.D.

INTRODUCTION

At the present time there is an unprecendented interest in the subject of nutrition in this country by our people, by consumer advocate groups, by health food promoters, by voluntary health agencies and by the U.S. government through its various departments and congressional committees. This interest provides unusual opportunities for health education in the field of nutrition and it behooves all of us who are professionals in this field to take advantage of this receptive market. It is obvious that a receptive audience also provides opportunity for quacks and charlatans to sell their ideas on the value of health foods, nostrums and even dangerous drugs like laetrile and pangamic acid. In a way, the American public has become a battleground for selling nutritional ideas based on both fact and fiction. Scientific bodies are arguing that more research is needed to develop the scientific knowledge to provide the basis for improved nutrition education, whereas the health quacks are promoting cures for all chronic diseases through nuts, fruits, fad diets and attractively packaged powders.

EVALUATION OF A NUTRITIONAL CLAIM

How does one distinguish fact from fiction in any science? There are three general guidelines to appraise the validity of a scientific claim. The first is the quality of the scientist or educator making the claim. What kind of credentials does he have? Does he have a sound education in the field in which he claims to be an expert? In the field of biomedical science this would mean a liberal arts education followed by study at a professional school for a proper terminal degree, i.e. MS (hygiene) MPH, Ph.D. or M.D. followed by appropriate post-degree training and/or experience in research. If he holds an academic appointment, is it in a first class Department in a University that has a record for solid achievements in his science? Is he a member of peer-rated scientific organizations such as those making up the Federated American Societies for Experimental Biology (FASEB)?

There are many false prophets today who are claiming to have advanced degrees who in fact have obtained them in diploma mills without any scientific work, who also claim publications which have not appeared in peer reviewed journals. Most nutrition quacks are loaded with titles, short on education, long on promises, antimedical in orientation, and full of unorthodox and ritualistic advide about diet.

The second guideline deals with quality and quantity of evidence adduced to support a claim. Has the scientific method been followed in obtaining this evidence? Is there a hypothesis stated followed by the design of the experiment to test this hypothesis? Were sound laboratory and/or clinical methods used in the conduct of the experiment? Can the data be reproduced in other laboratories or clinics?

The third criterion deals with the interpretation of the results of the experiment. Do the conclusions follow from the evidence? Do the conclusions demonstrate coherence, internal consistency and plausibility? Do they support or deny the original hypothesis? If denied, is a new hypothesis put forward?

When evaluating claims, one must be sensitive to the power of food mythology. Is there any scientific basis for a claim or is it part of food mythology. The idea that foods have emotional and cultural value as well as nutritional value is rooted in ancient beliefs. Many foods are recommended for their superior power for producing "good vibrations," for healing and for preventing disease.[1] This faith in foods which has no scientific basis is exploited by the health food industry. Many claims have been made about the special values of foods and nutrients in preventing given disease such as honey for arthritis, vitamin E for infertility, fruits for weight reduction, "vitamin B_{17}" (laetrile), and vitamin C for cancer. The health food promoters teach that meat and animal products are bad but cereals are good, food additives are bad, but vitamins are very good. Not only bonafide vitamins are recommended in large amounts beyond any reasonable human requirement but phony vitamins such as vitamin B_{15} (pangamic acid) and vitamin B_{17} (laetrile) are advertised as vitamins when in fact they have no biological value as vitamins and can be harmful.

Hilda Bruch,[2] a psychiatrist, points out that food quackery and cultism have complex and deeply imbedded roots in the human mind. Why people turn to quackery instead of legitimate health professions cannot be understood in isolation. There is a need to recognize the victims denial of illness, the uncritical belief in rituals and bizzarre and unrealistic promises and latent deep-seated mistrust of the medical profession. Rynearson,[3] pointed out that almost half the population in the United States in 1972 would not regard as worthless any cancer cure regarded by scientists and doctors as worthless and only 45% of the population would consider that such worthless treatment should be banned by law. "Cancer Ward" by Solzhenitsyn[4] is a novel illustrating how many persons, regardless of education, intelligence and background when confronted by the possibility of early death may come to believe in miracle drugs, secret formulas and special herbs and foods. The health food industry prospers in this environment.

With that preamble I would like to illustrate the process of separating fact from fiction by two projects of the Food and Nutrition Board (FNB) of the National Academy of Sciences. The first is concerned with setting the recommended dietary allowances for nutrients (RDA) and the second deals with the elaboration of their report[4], "Toward Healthful Diets" which played to mixed reviews when it was issued in May of 1980. It discussed dietary guidelines for the prevention of the chronic degenerative diseases.

RECOMMENDED DIETARY ALLOWANCES

The approximately 44 essential nutrients for adult human beings are presented in Table I. I show this because the vocabulary required to communicate nutrition information in this form requires scientific training in chemistry. This is suitable for medical students of many health professionals but is not suitable for the average layman who is interested in obtaining these 44 chemicals everyday in adequate amounts. To this end food groupings were used by the USDA as early as 1916[5] to teach the balanced diet. The "basic 7" emerged in 1943 and was gradually modified to become the "basic 4".[6,7]

The "basic four" system recommends that one take daily a minimum of four servings of fruits and vegetables, four servings of cereals and grains, two servings of dairy products and two servings of the meat group which contains legumes as well as red meat, fish and fowl daily. Energy uptake should be adjusted to maintain a desired body weight. The vocabulary here involves foods and not nutrients. This message has been successfully communicated to many individuals and is the mainstay of nutrition education in the schools, colleges and in continuing education program.

The Food and Nutrition Board was created by Franklin D. Roosevelt during World War II. The Board was charged with the responsibility of encouraging nutritional practices by the U.S. population that would allow for maintenance and promotion of health. The first problem undertaken by the Board was the assembly of a data base which would enable it to make recommendations regarding amounts of essential nutrients that would assure adequate nutrition in the U.S. population. Such allowances were calculated to exceed nutrition requirements by a safety margin related to the statistical spread of requirements in a normal population.

If one studies the vitamin, mineral, amino acid and energy requirements of a representative group of healthy persons one will obtain in each case a range of requirements which will approach a normal distribution curve. On the basis of a statistical analysis of such a curve one can conclude that two standard deviations above the mean requirement will encompass 97.5% of the people at risk. Allowances are thus defined as levels of intake of essential nutritients considered in the judgement of the Food and Nutrition Board on the basis of available scientific knowledge to be adequate to meet the known nutritional needs of practically all healthy persons. The cutting point therefore is placed at the high end of the requirements and by definition is higher than the requirements of 97% of the population. This point is sometimes lost sight of in using the RDAs for various other purposes than those for which it was intended, namely the planning of adequate diets for populations.

The Food and Nutrition Board bases its recommendations, on a large body of data which is derived from epidemiologic studies, studies in clinical medicine in which cases of overt deficiency disease are diagnosed and treated, clinical investigations in which the diet is altered to bring it below and then above the putative requirement using appropriate biochemical indicators, clinical trials in which supplementation or fortification is used to control disease in a population and finally studies of appropriate animal models.

Sources of variation in nutritional requirements are shown in Figure 1. Fifteen sources of variation in the uptake, absorption, transport uptake, metabolism and excretion of nutrients are shown. Nutrients can be supplemented by either diet or the bacterial flora of the gastrointestinal tract. Essential nutrients can also be derived from other dietary nutrients such as niacin from tryptophane, retinal from carotene and menaquinone from menadione. Absorption of nutrients is variable in health because of the impact of macronutrient intake in the absorptive process, i.e. glucose for sodium, triglyceride for the fat-soluble vitamins and phytate for calcium. Transport of nutrients from the gastrointestinal tract to various organs of the body is also variable. Some nutrients like vitamin A and vitamin B_{12} require carriers whereas others like glucose and amino acids can be moved as solutes in plasma. Nutrients must then be taken up by cells. Some transfers involve transport proteins which are hormone dependent, for example glucose and amino acid, uptake in some tissues is dependent on insulin. Some nutrient transfers are dependent on receptor molecules in the membrane: RBP-receptor proteins read the vehicle (RBP) for vitamin A as do the LDL receptors which move lipids across the cell membrane.

In the tissues the nutrient is utilized, stored or converted to an active form. The B complex vitamins are generally converted to cofactors by derivatization with phosphate or nucleotides. Some fat-soluble vitamins are oxidized or reduced to yield the active form. The active form finally combines with an apoprotein to generate enzyme activity. The tissues metabolize nutrients to inactive as well as active forms. Some circulate to the liver where they enter bile and are returned to plasma. Many vitamins are excreted in the urine as derivatives or metabolites. All nutrients are stored to some extent. Some are stored simply by expanding the body pool size, i.e. vitamin. C. Other vitamins are stored as co-enzymes in amounts exceeding the amount required to saturate their respective apoenzymes whereas some fat-soluble vitamins are esterified with fatty acids.

All in all, 15 sites of variation in handling nutrients in normal healthy beings are noted. This variation gives a maximum overall change of 2-3 fold in requirements, not 100 fold or 1,000 fold. We have rare genetic diseases in which the apopeptide is altered in such a way as to provide a very low affinity for the coenzyme, which increases requirements 10 or more fold. It is not true, however, that there is a large proportion of healthy persons with this kind of enhanced requirement. This is one of the fictional claims of many megavitamin proponents.

Evolution of the RDA

The Food and Nutrition Board has reviewed the subject of Recommended Daily Allowances (RDAs) nine times since 1941. The ninth edition was published in 1980.[8] Figure 2 shows the extent to which the Food and Nutrition Board has made recommendations during each of its ten deliberations with respect to the number of known nutrients in each of the three categories. In 1941, the macronutrients were considered to be four: Carbohydrate, protein, fat, and total calories. The isodynamic law of Rubner was thought to apply to protein, fat, and carbohydrate above the requirements for essential amino acids and fatty acids. Of the essential minerals, only ten were known in 1941: sodium, potassium, calcium, phosphorus, magnesium, iron, copper, manganese, zinc, and iodine. Molybdenum, selenium, chromium, silicon, tin, nickel, fluoride, and vanadium have been discovered since. All of the thirteen vitamins known to be important in human nutrition were known in 1941.

In the macronutrient category, allowances for the only two nutrients, protein and calories, have been recommended from 1943 to the present. With regard to minerals, only two minerals were considered worth recommendations (calcium and iron) in 1943, but, as the data base expanded, the number went to four in 1968 and to six in 1974. In addition to calcium and iron, recommendations are now made for posphorus, iodine, magnesium, and zinc. In the 1980 edition, there are tentative recommendations, i.e. ranges, for six additional trace nutrients: Selenium, copper, manganese, molybdenum, fluoride, and chromium. Recommendations were made for only four vitamins in 1943, namely vitamin A, thiamin, riboflavin, and ascorbic acid; over the next five years, the number rose to six, niacin and vitamin D being added. This number remained constant until 1968, when four more vitamins were added: Folic acid, vitamin B_6, vitamin B_{12}, and vitamin E. Allowances will be set for the same ten vitamins in 1980, although tentative allowances will also be made for pantothenic acid and biotin. Vitamin K, which is synthesized by intestinal microflora in sufficient amounts to meet nutritional requirements under ordinary conditions, does not have a recommendation.

The increase in the number of nutrients for which RDA have been recommended over 4 decades, i.e. 8 in 1943 and 18 in 1980, illustrates the evolution of knowledge in the field. This evolution and refinement of the RDA should continue as additional data become available.

The RDA for Ascorbic Acid

The RDA have been criticized by both professional and non-professional persons as being both too high and too low. I should like to discuss the case of ascorbic acid for which there has been extensive criticism that the RDA of 60 mg/day for adults is too low and that the RDA should be in excess of 1000 mg/day.

Pauling is one of the chief proponents of this view claiming special preventive powers for megadoses of the vitamin C against virus infections, particularly the common cold,[10] hypercholesterolemia, mental dullness, and cancer.[11] Pauling recommends a daily intake of 4000 mg/day for adults in order to produce optimal health.[12] This is a fiction based on inappropriate animal models, clinical anecdotes and uncontrolled clinical trials.[13]

Hodges and his colleagues have carried out extensive studies of vitamin C requirement in man. They report that scurvy can be prevented with doses of 10mg/day corresponded to a body pool size of 300 mg. An intake of 50 mg/day of ascorbic acid is required to maintain a pool size of 1500 mg, which is roughly half-saturation of tissues with ascorbic acid and corresponds to a plasma level of 0.7 mg/dl. It will also protect a healthy person deprived of ascorbic acid against scurvy for 60 days during which period the pool of tissue ascorbate is reduced from 1500 to 300 mg. Full saturation of the body with ascorbic acid yielding a pool size of 3000 mg which can be maintained on a daily intake of 200 mg/day. It is of interest that marked increases in excretion and oxidation of ascorbic acid occurs at a pool size in excess of 1500 mg. Furthermore, the toxic effects of ascorbic acid when taken in megadoses include dehydration, increased oxalate synthesis with the formation of renal calculi, increased uptake of heavy metals, and depressed plasma levels of ascorbate after withdrawal of the megadose.

The total evidence supports the RDA recommended by the FNB for ascorbic acid as that amount that will meet the established requirements of essentially all healthy persons.

TOWARD HEALTHFUL DIETS

As part of its general concern about dietary practices in the U.S.A. the Food and Nutrition Board decided in 1978 to review a number of dietary guidelines issued by voluntary health agencies, consumer advocates, and various agencies and committees in the government, designed to prevent a number of chronic degenerative diseases. The principle question asked was whether these dietary guidelines were based on scientific evidence of sufficient strength to justify making recommendations to the general public. The American Heart Association (AHA) started a public health education program in 1968 designed to prevent coronary heart disease (CHD) in the general population which has remained unchanged for the past 10 years.[15] The Senate Select Committee on Nutrition and Human Needs published a statement in 1977 entitled "Dietary Goals for the United States"[16,17] in which they reiterated many of the recommendations of the AHA aimed at preventing coronary heart disease but then extended them to persons at risk for cancer and stroke as well.

In preparing its report over a two year period a 6-man task force of the FNB reviewed some 400 medical papers dealing with the epidemiology, clinical investigations, relevant annual studies and preventative clinical trials of 5 chronic degenerative diseases, i.e. obesity, cardiovascular disease (principally CHD), hypertension, cancer and diabetes mellitus. Its report "Toward Healthful Diets",[18] which was ratified unanimously by the 15-member Board, was published in May of 1980. Its rather conservative recommendations (beyond the RDA) are shown in Table II.

Although these guidelines were supported by the American Medical Association, who had earlier issued similar conservative dietary advice to Americans,[19] the American Heart Association, consumer advocates, the government Departments of Agriculture and Health and many journalists were quick to attack the report as well as its authors. The furor illustrated the extent to which emotion, politics and food mythology has captured the thinking of many health agencies in developing their programs of preventive medicine.

Criteria for Guidelines

In developing its report the FNB considered dietary modification as only one of a number of aspects of preventive medicine. Other important measures include breastfeeding in infancy, immunization, prevention of accidents, avoidance of cigarette smoking and alcohol abuse, and improved physical fitness. Assessment by health professionals of risk factors for cardiovascular disease such as hyperglycemia, hypercholesterolemia, hypertension, obesity, cigarette smoking, and family disease history is also advised. Secondly, the FNB believes that epidemiologic data should not be the sole basis for recommending public health action. Epidemiology, which seeks to associate factors in the person or in the environment with a disease, cannot by itself prove cause and effect. In fact Bradford Hill[20] listed nine collateral characteristics of a statistically significant association that might lead an observer to the conclusion that the two variables were related as cause and effect. One was the power of intervention. Finally, the FNB believes that proof of benefit should be demonstrated before recommendations are made to the public.

The Force of Epidemiological Data

Epidemiology is the medical science which attempts to relate disease incidence and prevalence to variables in the host and environment. Although epidemiology can establish associations between an environmental or host variable and occurrence of a disease. Such proof must come from other kinds of biological experiments. The epidemiology of tuberculosis, before the discovery of the tubercle bacillus by Robert Koch in 1882, demonstrated associations with poverty, malnutrition, crowding, certain physical types and family clusters. Most epidemiologists thought tuberculosis was a disease of malnutrition. When Koch announced his discovery, there was so much skepticism in the medical profession that he had found the "casual" microorganism for tuberculosis, Koch set four criteria, other than the epidemiological evidence, to establish the agent of this disease. These requirements for animal experimentation have come to be known as Koch's postulates.

With respect to the chronic degenerative diseases, we do not at this time, know the agents of atherosclerosis, hypertension, cancer, and stroke. Epidemiological studies or coronary artery disease have shown statistically valid associations with dietary fat, protein, sugar, cholesterol, plasma cholesterol and low density lipoprotein (LDL) cholesterol, smoking, obsessive-compulsive competitive (Type A) personality, lack of exercise, soft drinking water, family history of heart disease and the per capita usage of television. The epidemiology of hypertension has revealed associations with dietary salt, genetic predisposition, social stress, renal disease, both high and low plasma renin, and both adrenal cortical and medullary overactivity. In the southern U.S., negroes have more hypertension than whites. In epidemiological studies of cancer incidence, associations have been developed with cigarette smoking, virus infections, x-irradiation, lack of circumcision, use of immunosuppressive drugs, and exposure to such industrial chemicals as chromate, vinyl chloride, arsenic, and polycyclic hydrocarbons. High fat diets are associated with cancer of the colon whereas low fat diets are associated with cancer of the stomach. In fact recently it has been shown that low serum cholesterol levels (<200 mg/dl) are associated with increased risk of cancer in men and strokes in women.[21,22,23]

The Role of Dietary Cholesterol and Fat

The FNB did not make a recommendation on dietary cholesterol because the data linking dietary cholesterol with cardiovascular disease are very weak. The intake of dietary cholesterol in the United States does not correlate with the rise in incidence of coronary heart disease that occurred in this country between 1920 and 1963, nor with its fall from 1963 to the present time.[23] In the United States no correlation exists between any dietary component, including cholesterol, and risk of coronary heart disease. Furthermore, altering dietary cholesterol over a wide range has little, if any, effect on serum cholesterol in free-living populations. The FNB does not deny the importance of serum cholesterol, in particular LDL-cholesterol, as a risk factor for coronary heart disease. It also supports the view that HDL-cholesterol is a protective form of the sterol. It believes, in company with expert committees from Canada, England, Australia, New Zealand, and Norway,[24] that dietary cholesterol is **not** a risk factor for coronary heart disease.

As regards fat, the FNB was simply unwilling to make a general recommendation on dietary fat for all healthy persons. Children and active adolescents need 40% of calories for fat to supply their energy requirements whereas individuals who subsist on low energy intakes, whether due to weight reduction programs or very sedentary activity should reduce their fat to 35% of kcals.

The Power of Intervention

Dietary intervention to reduce serum cholesterol levels has not been successful in reducing overall mortality in middle-aged persons. Most knowledgeable scientists admit that proof of benefit has not been demonstrated for fat modification of western diets. The FNB believes that a properly conducted and positive clinical intervention trial of the effect of diet (and/or drugs) on morbidity and motality from coronary artery disease, as well as mortality from all causes, is necessary before one can advise physicians and the public at large to adopt a regimen designed to prevent this disease. For example, clinical trials of the value of small pox and polio vaccination were strikingly positive, and only after they were completed was public health action initiated which has now resulted in the eradication of these two diseases.

We do not have similar data on the effect of diet on mortality in patients with coronary artery disease. In 1976, Ahrens[25] summarized eleven intervention trials in five countries, in which diet or drug therapy aimed at lowering serum cholesterol was studied for an effect on heart attacks and overall mortality. These clinical trials involved about five thousand men studied for 40,000 man years. A 5 to 16 per cent decrease in serum cholesterol was accomplished without affecting overall mortality. Some of these were secondary preventative studies involving persons with a prior heart attack, and some were primary, using subjects free of known previous disease. These subjects ranged in age from thirty to fifty-nine years. In some studies the frequency of coronary events was reduced but other causes of death, notably cancer, increased.

Spontaneous Changes in CHD

From 1920 to 1960, the mortality rate from coronary heart disease (CHD) in the USA increased drastically. Strangely enough, beginning in 1963, it began to decrease at the rate of 1-2% per year and is still declining. There is no clear single reason for either the rise or the fall.[26] Since 1920, animal-fat intake in this country has been constant, and the increase in total percent of calories from fat has been due to increases in intake of vegetable oils. Dietary cholesterol intake did change significantly from 1900 to 1970. Cigarette smoking has increased, but the curve showing the rise in lung cancer has a different shape from that showing the rise in coronary disease. The fall in the mortality rate from CHD during the past 20 years is equally mysterious (HEW, 1979). No single change can be implicated. The cause may in part be the result of a combination of small changes in cigarette smoking, blood pressure control, improved physical fitness, improved general health care, and small changes in diet toward a more polyunsaturated fat intake. The changes in serum cholesterol levels over the past 20 years have not exceeded 3-5% (6-12 mg/dl), which is not sufficient, of itself, to account for the change in the mortality rate from CHD.

Evolution of Dietary Guidelines

"Toward Healthful Diets" was an exercise in separating fact from fiction with respect to the etiology of atherosclerosis and from other chronic degenerative diseases in man and like the RDA will be evolutionary over a period of time. Although the first edition provided a great deal of criticism from the American Heart Association, consumer advocates and the press, it did make some converts. Notable among these was Thomas James M.D. who in his presidential address to the American Heart Association in 1980[27] said, "Today I want to share with you my growing concern about overpromise in coronary disease. My remarks center around the credibility of the AHA and medical science generally." He continued by making four main points in his address: (1) we should be more explicit, i.e. make full disclosures of the basis for public recommendations; (2) we should distinguish between risk reduction and true prevention for individuals; (3) we should be aware of the coercive power of public advice, i.e. in generating regulation, and (4) we should admit that we do not know the full effects of dietary restriction in childhood.

The FNB is a model system, albeit imperfect, separating fact from fiction. All of us as nutrition scientists must be critical of our own and others work, and conclude **only** what clearly follows from the experimental data. What is particularly important is not to extend animal experimentation to man without testing the question in human beings. The viewpoint must also be taught to our medical and graduate students.

NUTRITION EDUCATION PROGRAM FOR MEDICAL STUDENTS

Design of Program

At St. Louis University School of Medicine a group of us have studied two methods of teaching nutrition to medical students.[28] In the initial phase, the faculty developed an integrated approach to teaching nutrition to medical students based on the "Frankle Model". A school-wide Nutrition Education Committee reviewed the nutrition components of the existing required medical school courses and clerkships in order to ascertain the extent and distribution of nutrition information in the curriculum. Nutrition topics were introduced into existing course curricula and clinics in order to meet assessed needs and provide enrichment. Committee members gave formal lectures and conducted regularly scheduled nutrition rounds and tutorials. In addition, they served as instructors for elective courses in both clinical nutrition and nutrition research. Hospital dietitians regularly participated in conferences and clinical rounds and conducted special seminars for medical students, including "dietitian's luncheons", to demonstrate the practical aspects of nutritional and dietetic concepts.

This integrated program was instituted at the beginning of the 1978-79 academic year and was continued into the 1979-80 academic year. An examination was developed to evaluate the educational impact of the program. It consisted of 50 objective questions in both basic and clinical nutrition and was given at the beginning of each of the two academic years. The results of the first examination served as the basis for the subsequent evaluation of the program. The same examination was given a second time, one year later, to measure differences within a given class over time and to compare the class scores after one year of the integrated program to the baseline class scores.

In 1979-1980 it was decided to develop and implement a required course in clinical nutrition to be given in the third trimester of the freshman year. The course, intitled Introduction to Human Nutrition, was designed to provide specific instruction in clinical nutrition and a framework within which the student could begin to integrate all the elements of nutrition taught in the basic and clinical sciences. The course, consisting of 22 lecture hours, emphasized what is nutrient- and disease-oriented without excessive duplication of concepts taught in the basic sciences courses. It introduced aspects of clinical medicine via exercises in nutritional assessment and patient management. The examination scores are shown in Table III. The test scores in the fall of 1979 showed no significant change for 1978 when comparing classes at the same academic level; this suggested no impact of the integrated nutrition program on student education during the 1978-79 academic year. The slope of the learning curve from freshman to seniors was not affected in the one year of integrated teaching. The results of the freshman examination given in the spring of 1980, after the required nutrition course, however, were significantly better than the scores of the sophomores of 1978 and 1979 and compared favorably to the junior class scores.

CONCLUSIONS

Nutrition material taught in the context of other courses, such as biochemistry or physiology, is not perceived by medical students as nutritional **per se**. The subject matter is identified with the course within which it is taught. The students are not thinking "nutrition" but rather "biochemstry" or "physiology" and are not likely to identify the material as "nutritional" unless it is called nutritional. Food faddism, furthermore, is not identified as nutrition misinformation. Much of it is not assimilated if given scattered through the curriculum. This may account for lack of difference in nutrition knowledge between the two sophomore classes and for the sharp improvement of nutrition knowledge in the 1979-80 freshman after taking the nutrition course.

It is concluded that a required nutrition course, in the first or second year, is the most efficient way to teach nutrition to medical students. The broad topic of nutrition is ideal for focusing basic science concepts on clinical phenomena. Medical school curriculum committees should give serious consideration to instituting a required course in clinical nutrition in a transitional period of the curriculum. The resulting increase in knowledge by future physicians will provide a framework for developing informed opinions on nutrition topics, including the ability to distinguish fact from fiction, and the capability of providing better health care.

Table I

A Chemically Defined Adequate Diet For A Sedentary Adult Man

Name	Amount	Name	Amount	Name	Amount
WATER		CALORIES		BULK	
		Glucose	600 g	Cellulose	20 g
MINERALS					
Ammonium acetate	20.8 g	AMINO ACIDS		VITAMINS	
Calcium acid phosphate	5.0 g				
Sodium chloride	3.0 g	L-Leucine	1.1 g	Ascorbic Acid	100 mg
Potassium chloride	3.0 g	L-Methionine	1.1 g	Vitamin E	20 mg
Magnesium carbonate	1.0 g	L-Phenylalanine	1.1 g	Niacin	20 mg
Zinc sulfate	50 mg	L-Lysine	0.8 g	Pantothenate	10 mg
Ferrous sulfate	20 mg	L-Valine	0.8 g	Pyridoxine	3.5 mg
Manganese sulfate	10 mg	L-Isoleucine	0.7 g	Riboflavin	2.5 mg
Sodium silicate	10 mg	L-Tryptophan	0.3 g	Thiamin	1.5 mg
Chromium sulfate	5 mg	L-Threonine	0.5 g	Vitamin A	1.0 mg
Nickel sulfate	5 mg			Vitamin K	0.1 mg
Sodium selenate	5 mg			Folate	0.1 mg
Copper Sulfate	5 mg	FATTY ACIDS		Biotin	0.1 mg
Sodium fluoride	2 mg			Vitamin D	.01 mg
Sodium molybdate	2 mg	Trilinolein	5.0 g	Vitamin B_{12}	.01 mg
Stannous chloride	1 mg				
Potassium iodide	1 mg				
Sodium vanadate	0.1 mg				

Table II

Dietary Guidelines for adult Americans

* Select a nutritionally adequate diet from the foods available, by consuming each day appropriate servings of dairy products, meats or legumes, vegetables and fruits, and cereal and breads.

* Select as wide a variety of foods in each of the major food groups as is practicable in order to ensure a high probability of consuming adequate quantities of all essential nutrients.

* Adjust dietary energy intake and energy expenditure so as to maintain appropriate weight for height; if overweight, achieve appropriate weight reduction by decreasing total food and fat intake and by increasing physical activity.

* If the requirement for energy is low (e.g., reducing diet), reduce consumption of foods such as alcohol, sugars, fats, and oils, which provide calories but few other nutrients.

* Use salt in moderation; adequate but safe intakes are considered to range between 3 and 8 g of sodim chloride daily.

Table III

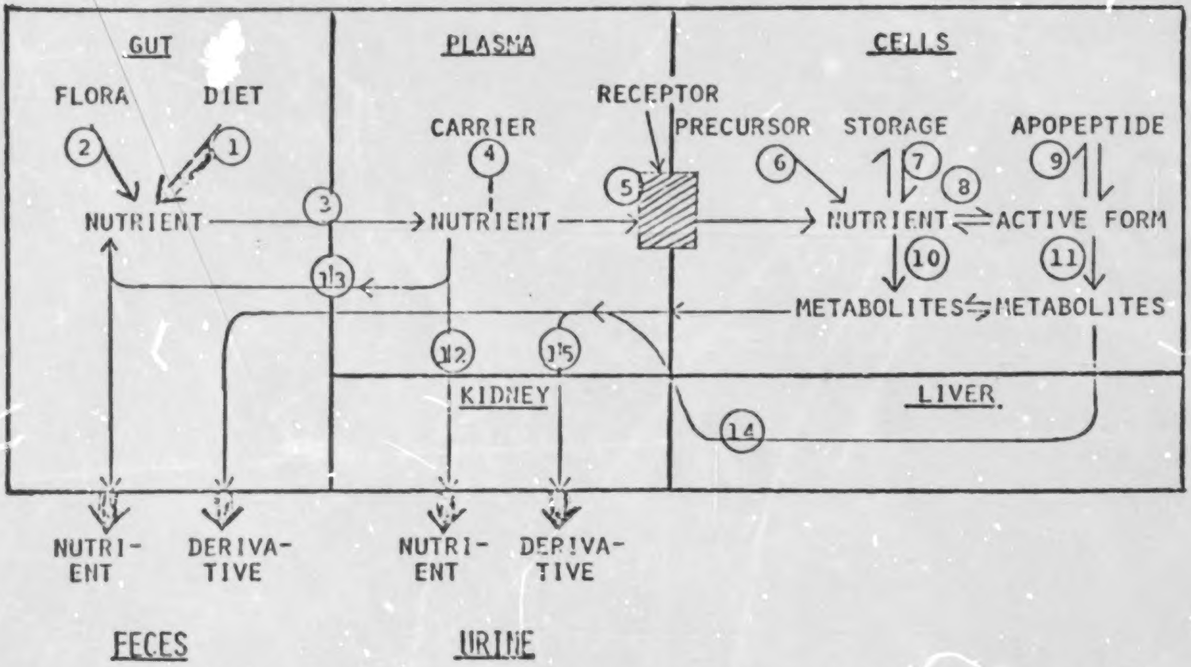
Percent of Correct Answers of Students on the Nutrition Examination by Class, St. Louis University School of Medicine.

Class*	Fall 1978	Fall 1979	Spring 1980
Freshmen	41.6	44.5	59.8†
Sophomores	52.5	53.4	
Juniors	60.6	56.6	
Seniors	61.5	63.7	

* $p<.001$ for class score trends.

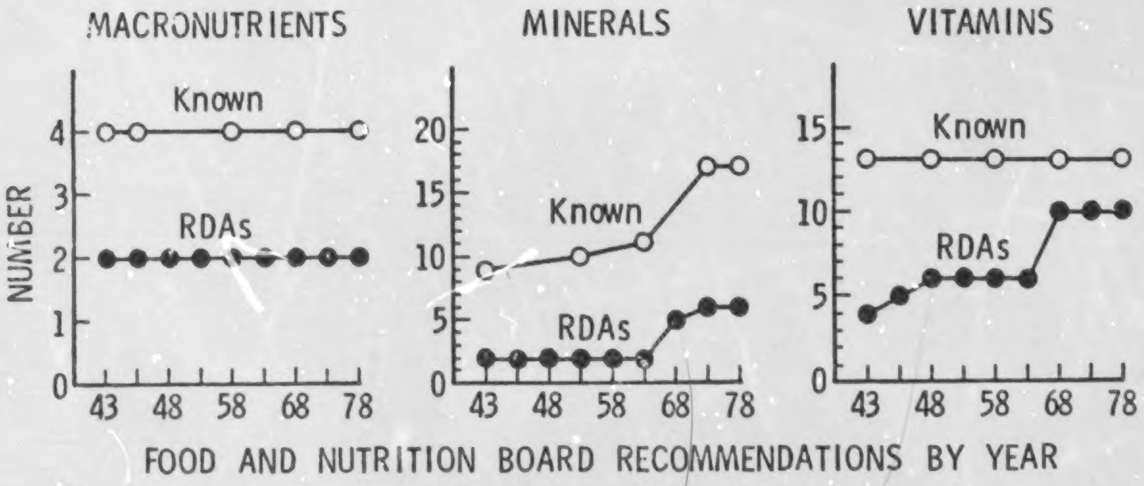
† After required course; $p<.001$ for difference compared with sophomore scores.

Fig. 1. Source of Variation in Nutritional Requirements


GUT
PLASMA
CELLS
FLORA
DIET
RECEPTOR
CARRIER
PRECURSOR
STORAGE
APOPEPTIDE
NUTRIENT
NUTRIENT
NUTRIENT
ACTIVE FORM
METABOLITES
METABOLITES
KIDNEY
LIVER
NUTRI-ENT
DERIVA-TIVE
NUTRI-ENT
DERIVA-TIVE
FECES
URINE
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15

A. Intake; 1. diet, 2. flora, 6, precursors; B. Absorption: 3; C. Transport; 4, carrier, 5. receptor, 12. renal clearance, 13. gut clearance; E. Utilization; 8. activation, 9. cofactor binding, 7. storage, 10. metabolism of nutrient, 11. metabolism of cofactors; F. Excretion; 12. renal clearance, 13. gut clearance, 14. enterohepatic circulation, 15. excretion of metabolites.

Fig. 2. Nutritional knowledge and the dietary allowances recommended by the Food and Nutrition Board from 1943-1980. Known nutrients (0-0); RDAs (●-●).[9]



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MANAGEMENT OF THE NUTRITION CURRICULUM AT THE UNIVERSITY OF CALIFORNIA SAN FRANCISCO

Marion Nestle, Ph.D.

Summary

To meet the need for increased training in nutrition for health professions students and practitioners, the University of California San Francisco has developed a highly visible program of courses, services, and research that is staffed by members of the Schools of Dentistry, Medicine, Nursing, and Pharmacy and by the hospital Nutrition and Dietetics Department. Faculty and staff of UCSF's program now offer seventeen courses and major lecture series in nutrition that include required and elective instruction for nearly all health professional students on campus. The program emphasizes continuing education in nutrition for health professionals and has produced a variety of self-instructional materials for this purpose.

The Importance of Nutrition Education in the Training of Health Professionals

That health professions students and practitioners need better education in nutrition has been a major conclusion of numerous national conferences, reports, and comments since the early 1960s (1-4). During the past twenty years, it has become increasingly obvious that most health professions schools lack adequate nutrition instruction programs and faculty who are trained in nutrition and possess a working knowledge of the role of nutrition in clinical practice. By the early 1970s, specific suggestions as to how, when, and where nutrition might be integrated into health science curricula had been published (5) and a comprehensive curriculum that emphasized the interdisciplinary nature of applied nutrition instruction and practice had been designed (6). Nevertheless, the professional schools moved slowly to incorporate this information into their curricula. It was not until the late 1970s, that the American Medical Association's surveys of the nutrition curriculum of 118 U.S. medical schools revealed significant gains in the number of required and elective courses, clinical clerkships, research opportunities, and continuing education courses in nutrition (7,8).

This public and federal demand for increased nutrition instruction for health professionals reflects the fact that patients expect their physicians and other health professionals to be able to answer questions about nutrition, to counsel them on the diet appropriate to their stage in the life cycle, to prescribe the most reasonable therapeutic diets for common disorders, to be able to explain to them the conflicting (and well-publicized) claims of current research in nutrition, and — most important — to know how and when to refer them to a dietitian or nutritionist and to support these counseling efforts.

Hospitalized patients expect and require nutritional information and support, as well. The discovery of the widespread prevalence of severe malnutrition among hospitalized patients (9) has strengthened the need for adequate training in nutrition among health professionals who work in hospitals. It is important for health professionals to recognize malnutrition when it exists, to know when and how to order therapeutic diets, to order and administer intravenous and tube feedings, to evaluate the current state of knowledge of hospital nutritional support methods and benefits, and to refer patients to and to work with the hospital dietitian or nutritionist to provide nutritional support, education, and follow up.

Nutrition Training at the University of California San Francisco

To address these critical needs for increased training in both ambulatory and hospital nutrition, faculty and staff of the University of California San Francisco have been working for the past few years to develop a comprehensive program of nutrition instruction and training at both the undergraduate professional and postgraduate levels.

The Campus. USCF is the only one of the nine campuses of the University of California devoted exclusively to training in the heatlh sciences. It includes four professional schools of Dentistry, Medicine, Nursing, and Pharmacy. In addition, it trains graduate students in twenty fields of study, and allied health professional students in Dental Hygiene and Dietetics (Internship Program). The total student enrollment in all UCSF programs is approximately 2300 per year. The postgraduate enrollment is nearly as great; more than 1100 medical housestaff and nearly 500 postdoctoral fellows are in training in UCSF's three major health center sites.

Barriers to Nutrition Instruction in the Health Professions Schools. Within this academic and professional setting, several important factors have contributed to the previous lack of nutrition instruction in the training programs of the various schools. Because the professional schools do not contain departments of nutrition, no powerful organization exists within them to develop and support nutrition instruction on a permanent basis. Scheduling is also a problem. Professional school curricula are exceptionally crowded; preclinical students are in class for eight hours on most days. The addition of nutrition instruction into the existing curriculum requires that some other subject be eliminated. Curriculum committees do not like to make such decisions.

During the clinical training years, the introduction of nutrition instruction presents even more difficult problems. Clinical curricula are also crowded and there is great competition for the limited teaching hours available. More important, students are distributed in small numbers among widely scattered sites for clinical training. UCSF's clinical clerkship in Family and Community Medicine, for example, is conducted at two major hospitals in San Francisco, and at eight additional training sites in the Salinas, Santa Rosa, and Fresno areas. Few students in the class take any one clerkship at a given time.

Finally, because the curriculum and training schedules of the various professional schools differ and rarely overlap, it is exceedingly difficult to develop interdisciplinary training within this setting. As a result of these administrative problems, nutrition instruction has become fragmented and is taught separately within the curricula of the various professional schools. Lack of coordination of this instruction is a major barrier to increasing the training of health professional students in nutrition.

No simple solution exists to these problems. Introduction of a separate, required course in nutrition into existing curricula becomes difficult because of lack of departmental support and curriculum time. All students do not take elective courses. Integration of nutrition topics into many of the existing courses is often possible, but the individual lectures that result lack coordination or identification as important parts of the curriculum.

Goals of UCSF's Nutrition Program. At UCSF, we have begun to develop long-term solutions to these problems by deliberately adopting a strategy of integrating nutrition instruction into the health sciences curricula in as many different places and in as many different ways as it is possible and appropriate to do so. The goals of this approach have been 1) to expand the nutrition content of existing core and elective courses for all health professional students; 2) to develop new elective courses in basic and applied nutrition, 3) to provide postgraduate training in nutrition for clinicians, 4) to develop qualified nutrition faculty, 5) to increase the visibility and coordination of nutrition activities on campus, 6) to develop self-instructional materials for teaching nutrition, and — ultimately — 7) to integrate nutrition counseling and practice into standard patient care procedures.

For the past two years, the teaching program has been supported by a Curriculum Development Grant in Applied Nutrition from the Health Resources Administration. This grant stipulates that we train students of medicine and of at least two additional health science disciplines, that nutrition instruction be required of all students in the program, that students be trained in an ambulatory care setting, that training be interdisciplinary and applied, and that materials for nutrition instruction be produced.

Accomplishments of UCSF's Nutrition Program. Working together, our faculty and staff from the Schools of Dentistry, Medicine, Nursing, and Pharmacy, and from the hospital Nutrition and Dietetics Department, have made considerable progress toward many of these goals.

Guide to Nutrition Resources. With the help of grant funds, we have identified campus resources in nutrition (10). More than 75 UCSF faculty and staff provide food and nutrition support and counseling services. Nearly 100 faculty are engaged in research on some aspect of basic or applied nutrition. The identification of these individuals has increased the visibility of nutrition activities on campus and has contributed greatly to their interaction and coordination.

Increased Core and Elective Nutrition Instruction. The major achievement of UCSF's nutrition program has been the development of strong core and elective nutrition courses within each of the four professional schools. In addition to various lectures scattered throughout the training period, the schools now offer a total of seventeen courses or major lecture series devoted exclusively to basic and applied nutrition. Table I lists these courses, the schools that offer them, the approximate number of hours of instruction devoted to them, and their most recent student enrollments.

Significant amounts of nutrition instruction are now required for students in all of the major professional programs. The School of Dentistry requires nutrition instruction for all of its first- and third-year students, as well as for its dental hygiene trainees. The School of Medicine offers seven courses in nutrition. The major core teaching occurs in a twelve-hour block within the first-year biochemistry course, but it is followed by many other lectures (not listed) within the core curriculum. Three interdisciplinary elective courses for preclinical students routinely attract unusually large enrollments. The Nutritional Pathophysiology and Parenteral Nutrition clerkships attract a national pool of students. Three new courses have been developed for students in UCSF's gradute nursing programs. Finally, the School of Pharmacy has recently instituted a new core nutrition course for its third-year students.

Postgraduate Nutrition Instruction. UCSF faculty and nutritionists have developed an intensive two-day continuing education course directed toward basic and applied nutrition issues relevant to practice in outpatient clinics. This course, Nutrition for the Practicing Physician, was presented for the first time in April 1981, to approximately 100 participants, most of whom were physicians in general or family practice or in pediatrics (11).

Instructional Products. UCSF faculty and staff have produced a variety of self-instructional materials that can be used in clinical settings where trained faculty are not available to teach nutrition. These products include:

- — **Nutriton UCSF: a Resource Guide to Courses, Services, and Research** (10).
- — Syllabi for the major nutrition courses.
- — **Nutrition Guidelines for the Healthy Individual**, a patient education pamphlet produced by Doris Dare, R.D.
- — **Shapedown. Weight Management Program for Adolescents** (12).
- — Nutrition in Family Medicine, a pamphlet designed to provide nutrition information to family practice doctors and residents at Area Health Education Center training sites (13).
- — A home hyperalimentation manual for use by students and housestaff.
- — A manual for hospital parenteral and enteral nutrition use by students, housestaff, and faculty.
- — **Eating American Style: Strategies for Improving Nutrition,** a 45-minute videotape designed to teach nutritional counseling skills to physicians located in areas where dietetic services are unavailable (14).
- — **The Case of Mrs. Rush: Sociocultural Issues in Nutrition Counseling**, a 20-minute videotape that focuses on methods to overcome social and cultural barriers to successful nutrition intervention. (15)

These products are readily adaptable to the nutrition teaching needs of other institutions. They are available for purchase as indicated in the references.

Increased Visibility. UCSF's nutrition lectures, courses, and publications are identified by a distinctive Nutrition UCSF logo that is used widely to publicize the activities of our nutrition program. As a result of program activities and publicity, the campuswide nutrition education, service, and research activities form a highly visible presence at this university that has improved cooperation from administration and faculty to increase the nutritional content of the professional curricula, increased cooperation and communication among nutrition faculty and staff at the three major campus sites, and improved morale among the individuals engaged in these activities.

Given the success of this program, it is ironic that the Curriculum Development Grants were selected specifically as one of the projects to be eliminated in the Reagan administration 1981 fiscal year budget. At UCSF, we are fortunate that our curriculum is already in place. Other plans of our program, however, cannot now be completed. We regret the loss of this support at this crucial time.

The success of our teaching program has encouraged further interaction between nutrition teachers and practitioners among the various campus disciplines and it has greatly expanded campus interest in the overall nutrition program. We continue, however, to work toward improvement of our instructional program. Nutrition is still not used routinely in clinical practice. Malnutrition within hospitals and among the population continues to be overlooked. Physicians still do not utilize and support the valuable services of dietitians and nutritionists. Many health professional faculty continue to remain unaware of major nutritional issues in patient care.

This situation demonstrates the genuine need of health professionals for nutrition education. It also encourages us to continue to develop plans for increased undergraduate, postgraduate, and faculty training in basic and applied nutrition. Our major long-term goal remains to incorporate nutrition principles and practice into standard patient care procedures wherever it is appropriate to do so.

Table I.

Nutrition Courses and Major Lecture Series at the University of California San Francisco

Course or Lecture Series	Core Curriculum (Required)	Elective Curriculum	Approximate Hours of Instruction	Approximate Student Enrollment
School of Dentistry				
Principles of Nutrition (Lectures in Biochemistry)*	X		8	100
Human Nutrition: Current Topics	X		12	100
Nutrition in Preventive Dentistry	X		20	24
Nutrition for the Dental Hygienist	X		12	100
School of Medicine				
Nutritional Anthropology		X	30	10
Principles of Nutrition (Lectures in Biochemistry)*	X		12	150
Issues in Human Nutrition**		X	10	300
Practical Skills in Nutrition**		X	10	150
Sociocultural Factors in Nutrition**		X	10	120
Clerkship in Total Parenteral Nutrition		X	100	5
Clerkship in Nutritional Pathophysiology		X	100	20
School of Nursing				
Principles of Diet Therapy in Nursing Interventions		X	20	35
Maternal and Infant Nutrition**		X	20	25
Nutrition Counseling for Families	X		20	35
School of Pharmacy				
Principles of Nutrition (Lectures in Biochemistry)*	X		8	120
Nutrition	X		30	120
Inpatient Clinical Pharmacy — Nutrition Section	X		12	120

* Interdisciplinary Core Course

** Interdisciplinary Elective Course

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14. Morgan P. Eating American Style: Strategies for improving nutrition. Videotape, 45 minutes. Available for approximately $45.00 (purchase) or $3.00 (rental) from University of Southern California - Norris Medical Library, Learning Resources Center, Health Sciences Campus, 2025 Zonal Avenue, Los Angeles, CA 90033.
15. Nestle M. The case of Mrs. Rush: Sociocultural issues in nutrition counseling. Videotape, 20 minutes. $40.00*

*Available from Dr. Marion Nestle,
University of California School of Medicine,
Office of the Dean, Room S-224,
San Francisco, CA 94143.

MANAGEMENT OF THE NUTRITION CURRICULUM AT THE MONTEFIORE HOSPITAL AND MEDICAL CENTER

William B. Bateman, M.D.

Management is defined as "the act or art of managing" and managing as "achieving one's purpose." Thus a discussion of management should cover factors involved in the act or art of achieving one's purpose. Or, in this case factors essential to the development and implementation of a nutrition curriculum. For the sake of brevity and clarity, this presentation will be refined to a thorough description of four factors, namely decisions, that in my opinion and the opinion of our interdisciplinary faculty team had the greatest influence on the development and implementation of the nutrition curriculum we now have at the Residency Program in Social Medicine at Montefiore Hospital in the Bronx.

These key decisions are:

1. The decisions to fund curriculum development in nutrition made under President Carter's administration.
2. The decision made by the authors of the grant guidelines to require that the student population reached include at least two types of health professionals in addition to physicians.
3. Our decision to target house officers in a primary care residency program rather than medical students and,
4. The decision to not continue funding in the third year of the project made under the present administration.

I will now explain how each of these managment decisions influence a nutrition curriculum.

I. The decision to fund curriculum development in nutrition made under President Carter's administration.

The Residency Program in Social Medicine located at Montefiore Hospital and Medical Center, an affiliate of the Albert Einstein College of Medicine, is a postgraduate training program leading to board eligibility in either Pediatrics or Internal Medicine and emphasizing the development of the knowledge, skills, and attitudes important to the delivery of primary care pediatrics and internal medicine. Ambulatory based training is greatly emphasized and is accomplished at the Dr. Martin Luther King Jr., Health Center located in the South Bronx, an area of extreme socioeconomic deprivation.

It was the demands of primary care and the particular situation of our patient population, in addition to the traditionally inadequate teaching of nutrition in medical school, that led myself and many others in the Residency Program to seek a better understanding of applied or clinical nutrition.

Without specific funding, this desire led to various types of learning experiences in nutrition. These ranged from self instruction, always dangerous in an unfamiliar field, to sometimes highly enthusiastic presentations by some diet doctors in the area who described nutritional approaches to medical care claimed to cure the incurable or create a state of health and longevity I'd thought few had hoped for since Ponce de Leon. The net effect created a sense that what was known about applied nutrition was little and simple and boring; "there are four basic food groups and to eat well you . . . ," and that what was not known was loudly and, I might add, profitably claimed by several not so hard to find self proclaimed "experts in the field." In short, the science of nutrition seemed to deserve the position it had had at my medical school, a nearly invisible one. However, the stimulus for learning nutrition continued and, five or more years of the desire did at least result in one well designed course utilizing many guest speakers who were, for the most part, practicing nutritionists. This series of didactic presentations was at least able to create a sense of respect for the field of nutrition and caused many, including myself, to alter their own eating habits. However, there was no means of continuing the experience and changing the eating habits of our patients proved to require more than simply a better understanding of food and its relation to health and disease.

This was for us the state of the art when the curriculum development grants became available. By allowing us to add a full-time nutritionist to our faculty and to purchase consultant time and various educational materials, the funding allowed the creation of a broad based curriculum which facilitates both the learning and the application of the science of nutrition.

As evidenced by our history, without initial funding, even though it was sought, an appropriate nutrition curriculum could not be created because of the lack of time, expertise, and momentum. Two years of funding has given us each of these and we hope to never again function without an ongoing learning experience in applied nutrition. It has become such an integral part of our training so as to make it *untenable for us at least to claim a good training* experience in primary medical care without having a nutritional component.

II. The decision made by the authors of the grant guidelines to require that the student population reached include at least two types of health professionals in addition to physicians.

As apparent from my discussion of key decision number one, in seeking the development of a curriculum in nutrition our initial intent was to reach only physicians in training. The guidelines insistence that we include at least two other types of health professions students was at first, simply an obstacle to obtaining funds to develop something we wanted for our residents. However, this point of view changed and the wisdom of the requirement was seen well before the grant application was even submitted.

Three things, now closely linked to the success of our project, resulted directly from this requirement.

1. We were forced to form a working relationship with the Lehman College (CCNY) School of Nursing and the Nutrition Department of Teacher's College of Columbia University. This expanded our resources and potential resources far beyond that provided by the funding.
2. It forced me, as the author of the initial grant application, to struggle with the issue of how to train three disciplines at once in nutrition and hence come up with the design of what are now the Nutrition Intervention Teams at the martin Luther King Health Center. A resource we know to be a stimulating learning environment for nutrition education and that we expect will add a dimension of care always needed but never before achieved at the health center.
3. Perhaps most important, it led to the development of a faculty team consisting of a nurse, a nutritionist, a pediatrician, and an internist. This team designs and carries out the day to day activities of the curriculum. The breadth of training and experience has resulted in an exciting and effective venture in applied nutrition for our students and their clients.

III. Our decision to target house officers in a primary care residency program rather than medical students.

Being a residency program, it is obvious that we would choose to train residents with our project. I would now like to defend that as an extremely effective time to teach clinical nutrition to physicians in training.

First of all, the house officer is in a key position in medial training. While still learning and developing substantially as a physician, they are key to the minute to minute management of patients. In addition, in institutions affiliated with medical schools, they provide a great deal of teaching for medical students and serve as highly visible and approachable role models. In short, they frequently function as the right arm of both service and education.

This implies that the clinical behavior of house officers is pivotal in determining the nature of service delivery in an institution and forming the impressions which medical students on clinical rotations develop concerning the appropriate application of the basic sciences and principles of medicine. Thus training the house officer is, in a sense, a sine qua non in attempting to influence clinical behavior.

Also, the house officer, particularly those training in primary care, faces problems and concerns in the everyday care of patients that makes the relevance of nutrition in the practice of medicine immediately apparent, if expertise in nutrition is available. One cannot talk of disease prevention or follow an obese diabetic month after month without viewing nutrition as extremely important, at least. Thus, in addition to being an important group to reach, the nature of their role makes them highly receptive.

IV. The decision made under the present administration to not continue funding for the third year of the project.

My clarification of this key decision can be brief as no one expects the director of a funded project to feel that the withdrawal of funds is good. However, I want to use this opportunity to explain exactly what defunding means to us.

It will not mean the loss of the curriculum we were allowed to set up under the funding made available under President Carter. As mentioned before, we view it as too valuable. Also, the start up time has given us sufficient organization to find alternative sources of funding. Afterall, we always knew that federal funding was temporary.

So what is the impact of this premature withdrawal of funds? It forces us to now spend our time seeking funds and alliances which will sustain the curriculum. We would have had to do this anyway, but in being forced into it one year early some things which began as high priorities are now lower priorities. Namely, the objective evaluation of the impact of this curriculum and the refinement and national distribution of products. In essence, the very things that the federal government sought to pay for in the first place.

In conclusion, we are thankful to the Carter administration for allowing the development of our curriculum and we offer the Reagan administration a Bronx cheer for being penny wise and dollar foolish.

MANAGEMENT OF THE NUTRITION CURRICULUM AT YOUNGSTOWN STATE UNIVERSITY

Mary J. Beaubien, Ph.D.

Time is of the essence in this schedule, so I decided to be concise in both the oral and written presentation. The focus is the **pragmatics** of developing an interdisciplinary nutrition curriculum involving medical students and others. To continue the alliteration, this discussion will deal with some **problems**, some **products** and some **plans** we have identified in our work with the Interdisciplinary Curriculum in Applied Nutrition (I.C.A.N.).

A. PROBLEMS

1. TIME:

Three years (now 2) is a short time to develop and put in place such a complex program. Most of our medical school courses were 6-7 years in the making, and we are trying to do it in less than half that time.

2. COMPLEXITY OF CURRICULA AND SCHEDULES:

Medical: Faculties do not compete for hours in the medical curriculum, they fight for minutes! Curriculum planners feel nutrition is important, but so are many other areas of study. Marketing our program has turned out to be a priority.

Nursing: Our BSN students are all registered nurses, working 40 hours a week and scheduled into their classes on their two days off. Juniors are on campus Tuesday and Thursday; seniors on Monday and Wednesday. Fitting activities into the right days is a challenge, especially when several hours are already committed to didactic sessions.

Dietetics: Many dietetic students have completed the two-year dietetic tech degree and are working 20-40 hours per week Their work-class schedules are often very rigid. It takes juggling to get a three-person interdisciplinary team together at a time when hospital teams are scheduled.

3. KEEPING IT INTERDISCIPLINARY:

This is related to Problem #2. It would be easy to yield to the pressure to let the activites become unidisciplinary. Getting the teams of professionals together is a problem too, especially if teaming has not been their modus operandi. Fortunately, we have been able to identify some functioning teams who will work with us, and they have provided the most valuable experiences for students.

4. LACK OF EXPERTISE:

The project director would have to be knowledgeable in medicine, nursing and dietetics to develop a curriculum. The only satisfactory solution is to pool expertise, which means one also needs faculty teams. This can be challenging if the faculty are in different colleges/schools or even different campuses, as is the case in Youngstown.

5. FOLLOW-THROUGH:

We are always working with groups of professionals and students and the failure of any one to appear, or to perform, can jeopardize the entire activity, and have it deteriorate into a lecture, or worse.

6. USE OF IDEAS:

Ideas are freely given, and egotists may be offended if there is no follow-through. The curriculum as planned has flaws, and many of these ideas have been implemented. Some are outside the parameters of ICAN, and we have to keep people happy, even if we do not use all of their ideas.

7. NUMBERS OF PEOPLE:

The structure of our medical school, which has no hospital of its own, means that medical students are being trained at about 12 hospitals in three cities. I have not counted the number of physicians involved in the process, but the committee structure alone is a maze which takes a long time to master. We have talked to 50 physicians and still feel that lots of people have not heard of us. Communicating with nursing faculties is not as difficult because numbers are much smaller and the faculty structure is more compact.

8. PROOF OF EXPERTISE:

We are not physicians and frankly, we had to prove our expertise before we were able to make progress toward implementing the curriculum.

B. PRODUCTS

1. NOTORIETY:

We are now "the nutrition people" and have been recommended by medical school administrators for committee memberships and speaking engagements. Hospitals and other agencies increasingly consult us when the topic is nutrition.

2. MEDICAL APPLICATION CASE STUDIES:

Reception by faculty and students has been enthusiastic. Traditionally, only physicians had been invited to present seminars on special topics relating Medicine to Chemistry and Biology. With this project, Nutrition became incorporated into the Medical Application Case Studies and our dietetics faculty has been invited to present two-hour sessions to medical students on the topic of nutrition. Our suggestions for other speakers on nutrition have been accepted, and the seminars have been opened to dietetics and nursing students. We feel that this early exposure to nutrition is awakening an on-going interest among medical students.

3. SUMMER COURSE — NUTRITION IN CLINICAL CARE:

Students learn about assessment and care of patients with nutrition related problems and have interdisciplinary team experiences in a variety of settings. In 1980, we had one medical, two dietetics and two nursing students. In 1981, there were three medical, six nursing and three dietetics students. A syllabus has been developed and revised for use in this course, and the course evaluations are positive. Students are surprised at how much knowledge people in other disciplines have!

4. INSTRUCTIONAL MODULES:

Members of our curriculum committee, including university and clinical faculty, have written self-instructional modules dealing with a variety of nutrition topics. All have the same format, but they still turned out quite differently. The modules have been used for a year, and are now being reviewed by a team consisting of a physician, nurse and dietitian who specialize in that topic. Physicians are impressed with these self-instructional materials and have asked us to provide the modules to house staffs of hospitals. They also see these as an efficient way for medical students and residents to acquire knowledge of nutrition. We have placed copies of selected references in each hospital involved with the project.

5. NEW OPPORTUNITIES:

Opportunities for nursing and dietetics students to participate in interdisciplinary activities are increasing. For example, these students have attended grand rounds and the discussions that follow.

6. LITERATURE:

We have collected, annotated and referenced a large amount of pertinent journal articles. A reference list on a topic can be generated via computer at any time.

C. PLANS

In the next several years, we will continue to work to:

1. Foster interest in nutrition among medical and nursing students from the beginning of their college careers, and insert activities into their curricula at frequent intervals.
2. Write modules on a few more topics, such as Dental Nutrition.
3. Have students prepare materials for distribution in ambulatory care centers, clinics and physicians' offices in a campaign of preventive nutrition.
4. Improve the process of training interdisciplinary student and faculty teams.
5. Develop an Office of Nutrition at the Northeastern Ohio Universities College of Medicine. This office will insure a continued interest in nutrition in medical education.

Much of the road has been uphill, and we have a long way to go, but the respect and visibility for nutrition is growing, and we all continue to grow daily.

MANAGEMENT OF THE NUTRITION CURRICULUM AT THE UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN

Jon P. Bowermaster, Ph.D.

This paper describes the Interdisciplinary Applied Clinical Nutrition Program at the University of Illinois at Urbana-Champaign. It provides an update of our progress since our first report which was published in "Curriculum Development in Applied Nutrition," the proceedings of the conference held at the Woodruff Medical Center, Emory University, Atlanta, Georgia on Spetember 7-9, 1980. I also include a list of "principles" for the development and implementation of an Interdisciplinary Curriculum in Applied Clinical Nutrition. I have also attached a roster of the faculty and staff who worked so hard on this project. Their determination and creativity were the reasons for the successes we have had.

Background

The faculties and staffs of the School of Clinical Medicine, Urbana-Champaign, the University of Illinois College of Nursing, Urbana-Champaign, and the Clinical Dietetics Program of the College of Associated Health Professions have cooperated to develop and implement a set of instructional activities that are designed to allow our students to learn and apply key principles of applied clinical nutrition. Our materials also stimulate our students to begin learning to work with one another as professionals.

New Curricula

All three of the disciplines involved in this project have relatively new programs on the Urbana campus. The School of Clinical Medicine opened its doors in 1979, Clinical Dietetics admitted its first students in 1976, and the nursing curriculum, a baccalaureate completion program, began in 1974.

Size

The relatively small enrollment of the School of Clinical Medicine — 30 students per class, clinical dietetics — 9 students per class, and nursing total enrollment of 40 students is an important variable. We are able to closely observe our students and get immediate feedback about our instructional efforts. In addition, our size allows students from various disciplines to get to know one another and discuss such issues as interdisciplinary cooperation.

Strong Base in Nutrition

There was a strong base of competence in clinical nutrition on which to build our project. The nursing curriculum was already teaching nutrition in its existing courses. We had an operating, successful clinical dietetics program. The School of Clinical Medicine has two M.D.s with Ph.D.s in nutrition on its full-time faculty; Ralph A. Nelson, M.D., Ph.D. and Willard J. Visek, Ph.D., M.D., the Director of this curriculum development project. Also, at the University of Illinois at Urbana-Champaign, the College of Agriculture has a large food sciences research and training group. This program includes a curriculum which trains students to function as clinical dietitians. Finally, one of our affiliated community hospitals has a very strong interest in clinical nutrition.

Project Objectives and Supporting Instructional Activities

The following general objectives for our project were first reported in our 1980 report. A year's experience has confirmed that these goals were valid and attainable, thus our goals remain unchanged. Each student will:

1. Understand the role of other health care professionals in the nutritional care of patients.
2. Value the knoweldge, skills, and professionalism of other health care professionals.
3. Be able to carry out an examination of nutrition status based upon anthropometric measurements.
4. Be able to interview a patient to elicit a valid dietary history.
5. Understand key concepts of applied nutrition.
6. Be able to use his/her knowledge and skills to function as a member of a health care team in patient management, by including nutritional components in the health care plan.
7. Be able to assess community resources and determine what support systems are available to help meet patient's nutritional needs.
8. Be able to function as a member of a health care team to provide patient education about nutrition.
9. Gain an in-depth understanding of applied nutrition concepts.

Objectives number 1 and 2 are supported by all of our instructional activities. The other objectives are supported by specific activities as described below. The instructional activities move from basic knowledge and skills acquisition through their application. Finally, an elective "capstone" course is offered in advanced clinical nutrition topics. (The clinical dietetic students are required to take this course.)

The applied clinical nutrition curriculum is divided into four segments.

Segment I — History and Physical Examination/ Interviewing — Communication Skills

General Objectives

Each student will be able to:

1. Conduct nutritional-status physical examination.
2. Interview a patient to elicit a valid dietary history.
3. Effectively communicate with other members of the health care team.

Students Involved

1. Medical school sophomores,
2. Clinical dietetics seniors, and
3. Nursing students. (Presently the nursing students are instructed by members of the nursing faculty. This project has opened up channels of communication, and there will undoubtedly be some joint instruction in the future, especially when the nursing master's degree program opens on this campus.)

Instructional Activity

Instruction in History and Physical Examination: Faculty members from the Medical School and the Clinical Dietetics program cooperate in team teaching these skills to medical students.

Instruction in Communication Skills: In 1980-81 clinical dietetics, biocommunications art, and occupational therapy students participated in a joint one-semester course on interpersonal communication. The Nursing faculty presently teaches the same content to their students but scheduling problems preclude integration at present. Unfortunately, due to University-wide funding problems, the Urbana-based biocommunications art and occupational therapy curricula were eliminated. Consequently, in the 1981-82 academic year only the dietetics students remain in this course. Conversations are presently underway with faculty from the Speech and Hearing Sciences Department and the Institute for Child Behavior and Development to enroll some of their students in this course in order to preserve its interdisciplinary nature. In addition, efforts continue to allow medical students to modify their curriculum in order to participate.

Segment II — Cognitive Aspects of Applied Clinical Nutrition

General Objective

Each student will understand key concepts of applied clinical nutrition.

Students Involved

1. Medical school sophomores.
2. Clinical dietetic seniors, and
3. Nursing students.

Instructional Activity

Nutritional Tutorials: The clinical nutrition tutorial is a small-group teaching method in which medical students, clinical dietetic students, and nursing students work and learn together. These groups are facilitated by two tutors who are faculty members from the three disciplines. In 1980-81 it was planned that our students would participate in 16 hours of tutorial. Four "paper cases" (gastrointestinal disease, cardiovascular disease, teenage pregnancy, and preventive clinical nutrition) would be used. This activity took place and it was so successful that an additional "paper case" was developed for a patient with stroke and aphasia. Students from medicine, speech and hearing science, occupational therapy, and clinical dietetics participated.

All of the Applied Clinical Nutrition tutorial activity conducted in 1980-81 will be conducted in 1981-82. Based on our formative evaluation data, the "paper cases" will be refined.

The "paper cases" which are developed for use in the tutorials follow a general set of goals which guide our actions. The three goals are: 1) the discussion, application, and learning of concepts of clinical nutrition; 2) the interaction of individuals in an interdisciplinary manner toward the achievement of objectives; and 3) the understanding and development of facility with group process and peer review.

Overlap of process and goals occurs between the nutrition interdisciplinary tutorials and the regular clinical tutorials in the second-year Medical School curriculum. Our strategy aims at capitalizing on the unique opportunities in the interdisciplinary experience that clinical nutrition provides.

The strategy involves the use of paper cases. A paper case is a body of information on a patient which may include such things as a medical, nursing, and diet history, a physical, lab and x-ray values, and other pertinent data. A paper case may take several forms. Many people are familiar with the clinical pathology conference style, and some of our cases are written as such, others follow sequential presentation of data starting with medical history and physical and requiring specific requests from the students to obtain the remaining data. Others are a segment out of a hospital chart with medical, nursing, and dietitian progress notes presented.

At the onset of the project, several medical problems were chosen which have nutritional implications either in treatment, ideology, or both. Examples are malabsorption, chronic renal disease, or hyperlipemia. Curriculum case development teams were formed for each particular problem. The teams are composed of a nurse, dietitian, and a medical student.

The teams function in the following manner. An actual patient chart is obtained from one of the area clinicians which illustrates the particular problem. Together the team develops a list of learning objectives pertaining to the problem and incorporating the three goals mentioned earlier. Next, each team member extracts from the case information concerning his/her respective field and which pertains to the objectives. Each team member then writes his/her own section of the case and later they reconvene to discuss the case and combine the parts. Then, a first draft is typed and is distributed to various physicians, nurses, and dietitians for critique. Then the team regroups with their suggestions and discusses changes. After changes have been made and the case retyped, a final critique may be done, or if the changes were minimal only retyping in a final draft may be needed. We distribute the case in a packet to the facilitators of the tutorial sessions. Each packet contains a list of learning objectives, complete medical and nursing information on the case, a list of information resources, articles, books, community groups, a suggested format for the management of the tutorial, including specific learning issues arising from the case and ways in which the tutor might proceed, and a case evaluation form to be filled out by the tutor.

Segment III — Application of Applied Clinical Nutrition Concepts

The General Objectives

Each student will be able to:

1. Use his/her knowledge and skills to function as a member of a health care team in patient management including nutritional components in the health care plan.
2. Function as a member of a health care team to provide patient education about nutrition.

The students involved are medical school juniors and seniors, dietetic seniors, and nursing students.

Instructional Activity

PLATO Simulation: The computerized educational patient care simulation we are developing is designed to allow three students (one each in the respective fields of medicine, nursing, and dietetics) to participate in a three-sided interactive "game" in which a computer plays the role of a patient with one, or more, significant medical/nutritional problem(s). When it is operational, the simulation will require the students to assess the medical, nutritional, and to some extent, the socioeconomic status of the patient. On the basis of this assessment, the students must devise and implement a successful interdisciplinary strategy for meeting the patient's particular needs.

The simulation is scenario-based in that the patient care problems can be defined and run by a person who has no training in computer programming. The simulation contains a scenario editor which, when complete, will allow the instructor to define a patient care problem. There will be provision for at least 10 separate problems to be defined at any given time so that the students need only enter the simulation, select a program, and then begin work providing health care for the hypothetical patient. The instructor will have the option either of allowing the students to have prior knowledge of the kind of problem they are working on, or of making them diagnose the problem themselves.

Due to the changes necessitated by Congressional funding actions the development of this simulation is delayed. However, we have arranged for our programmer to be employed by the University of Illinois at Urbana-Champaign Medical Computing Laboratory so he will be able to finish this project. It will be available on the nationwide PLATO system in late 1982.

Apple Computer: We have developed a program on the Apple II-Plus computer which will assess an individual's nutritional status and a diet's nutritional adequacy.

When given an individual's height, weight, sex, age, and level of activity, the program computes the daily caloric requirement. When given four skin-fold measurements, it computes the percentage of body fat.

Health professionals can use this program to both evaluate and educate their clients. As the client watches, he/she can see how specific information is used to determine his/her condition. As the program progresses, the health professional can answer questions and help the client learn to take better care of him/herself.

In addition, the program can analyze food intake after giving the computer the kinds and amounts of food eaten. Over eleven hundred foods are in the computer's "data base." The dietary levels of fourteen nutrients are compated to the individual's Recommended Daily Allowance, and this information is colorfully displayed, revealing areas of adequacy and deficiency. All those concerned with the client's diet can then work together to design pleasing and nutritionally adequate menus.

A printout of both the individual analysis and of the diet can be included in the client's record.

Environment of the Program: Apple II or Apple II-Plus microcomputer with Pascal implementation; one disk drive system, printer is optional; this program can be converted to any system that supports UCSD Pascal and support graphics.

Patient Education Project: A plan has been drafted for an interdisciplinary patient education project. It includes plans for medical, nursing, and clinical dietitics students to participate in a three-week intensive course in which the students learn about such topics as the general philosophy and methods of patient education, planning patient education curricula, and general educational psychology. The plan includes hands on experience with lesson planning, speech delivery, lecturing, giving a demonstration/performance lesson, leading a guided discussion and visual aids development. The various teaching activities of the students would be videotaped to allow self-critique. Since this project was to be implemented during the third year of funding and since that funding is no longer available, it is not clear if this activity can be undertaken.

Community Assessment Project: A community assessment project which is already included in the dietetics and nursing curriculum has been modified into an interdisciplinary unit. This instructional package includes extensive demographic data about Champaign county. Participants in the experience will receive classroom instruction, participate in a walk/drive assessment experience, and participate in a tutorial session to discuss what they have learned didactically and observed personally. This package is currently in draft form. While we are planning to implement it is some form during the 1981-82 academic year, Congressional funding action has greatly disrupted our plans.

Audio-Visual Productions: The disruption caused by Congressional funding actions has significantly affected our production schedule. However, during 1981-82 we are planning to produce a three-part series on the nutritional assessment and management of patients.

Segment IV — Advanced Study in Applied Clinical Nutrition

General Objective

Each student shall understand in-depth issues in applied clinical nutrition.

A semester-long interdisciplinary course in advanced topics in applied clinical nutrition is offered as an elective to graduate students in the nutritional sciences, medical students, nursing students, and practicing health care professionals. Clinical dietetic students are required to take this course. The content is based on actual patient case presentations. The students are asked to produce synthesis papers which demonstrate mastery of advanced concepts.

Curriculum Development Principles

The following principles are suggested as guidelines for the interdisciplinary development of an interdisciplinary curriculum. They represent part of what we have learned from our project.

1. **Treat all disciplines as equal partners.**

   From the start a fundamental assumption of our project was that all three disciplines were equal partners. In our funding proposals each group shared approximately equally. We even tried to insure that research assistantships were evenly distributed. In our curriculum development activities no discipline had the "final say." Adherence to this principle is vital if one wants maximum productivity and cooperation from all concerned.

2. **Learn what one another does.**

   Our faculty incorrectly assumed that they know what one another did in the nutritional care of their patients. About six months into our project we realized that as a faculty we must learn about each other if we expect our students to do so. After this learning occurred, our development tasks were easier. If we had it to do over again, we would formalize this process and do it early in the project.

3. **Communicate openly.**

   Any group of people who really care about what they are doing will, from time to time, become frustrated. If the atmosphere is not condusive to openly dealing with those frustrations the group will loose much of its effectiveness. In general our faculty members felt free to "say what they thought" and consequently our development groups worked well together.

4. **Involve as many people as is possible and reasonable.**

   We made several efforts to include faculty and staff in our project who were not originally assigned to it and who were not funded by it. These efforts were very useful because we gained expertise and creativity. In addition, the "ownership" of the project was much broader than the small group with official time commitments to it.

5. **Develop protocols for instructional design.**

   In this project we had several teams developing similar materials. Since this development activity had never been done before we had to figure out how to do it. Instead of letting each group "learn the hard way" we developed written suggestions as to how to proceed. This saved us time and greatly increased our effectiveness.

6. **Develop clear instructional objectives for each set of materials before they are developed.**

   We used this fundamental principle of instructional design for all of our development activities. It saved us time, kept us organized, and provided a set of criteria for our formative evaluation activities.

7. **Have a clear, comprehensive instructional design for the project before the work begins.**

   Our project was carefully designed and the development tasks were specified before work began. This gave us a framework to guide our activities.

8. **Conduct formative evaluation.**

   Formative evaluation, evaluation conducted to provide feed back during the development (formation) of instructional efforts, was conducted throughout our project. The presence of a professional evaluator as a member of our development team provided us feedback that would not have otherwise been available. A professional evaluator can provide insight from a point of view that a subject matter expert cannot.

9. **Have a "neutral" project coordinator.**

   Our project had a coordinator (a different person from the project director) whose job was to coordinate all of the various development activities. He also provided instructional design expertise for them. Since this individual's major field of interest is educational psychology and not nursing, dietetics, or medicine, he was not bound by loyalty to one of those three disciplines. Consequently our goal of a shared undertaking was facilitated.

MANAGEMENT OF THE NUTRITION CURRICULUM AT THE MEDICAL COLLEGE OF GEORGIA

Maurice Levy, Ed.D. and Elaine B. Feldman, M.D.

The focus of this paper is to list and describe the benefits derived from an interdisciplinary nutrition education program initiated from a grant by the Bureau of Health Resources, Department of Health and Human Services. The challenges or problems encountered in the management of the curriculum are also discussed.

The success or failure of an educational program is primarily dependent upon the perceived benefits which the students, faculty, and institution derive from that program. If that educational program is grant funded, the goals and objectives of the program should be compatible with the stated aims of the grant program and the avowed direction in which the institution is moving.

The nutrition curriculum at the Medical College of Georgia (MCG) grew and evolved into a recognizable and strong force due to the interaction of a series of activities and occurances. Due to the funding of the Interdisciplinary Nutrition Education grant and later the Clinical Nutrition Research Unit (CNRU) grant that provided the resources for additional faculty, space, and programs, the Medical College was able to recruit and hire additional faculty for the program. The approval of the Georgia Institute for Human Nutrition by the Board of Regents of the University System gave the Nutrition Program greatly increased credibility and visibility which were both essential to the growth of the program. The support and encouragement of the Deans of the involved Schools also greatly assisted in the program development.

The benefits derived and challenges encountered exemplify the outcomes that took place in the nutrition program at the Medical College of Georgia. The curricular management greatly influenced the direction in which the nutrition curriculum expanded and matured. The listing and descriptions are not totally exhaustive, however they do present an accurate picture of the Nutrition development at the Medical College of Georgia.

I. Benefits derived from the Interdisciplinary Nutrition Education Program

1. The interdisciplinary program required a commitment from each of the Schools of Medicine, Nursing, Dentistry and Allied Health Sciences. This commitment resulted in improved communications between the various Schools in the area of Nutrition Education.
2. Along with improved communications came outstanding cooperation between the Schools. With one notable exception brought about by a change in the deanship of one of the involved schools, a deep and mutual respect for involved faculty in each of the participating schools grew and was nutured.
3. In addition to the interdisciplinary cooperation on the campus of MCG, another University System of Georgia school, Georgia State University in Atlanta, which is located some one hundred and fifty miles away, participated in the program in a mutually beneficial manner. Not only did their faculty participate enthusiastically while visiting the MCG campus twice a month, but their students were extremely important in the functioning of the interdisciplinary elective. These nutrition students from Georgia State helped to evaluate the status of the Nutrition Service in the MCG hospital and several students ended up accepting positions in clinical nutrition in the Augusta area.
4. When the nutrition course first began, residents in the School of Medicine received no graduate training in Nutrition. Through the development of the course, interns and residents in the Department of Medicine began first spending one afternoon per week for a month then progressed finally to participating in the Nutrition Program for an entire month.
5. Increased course content in Nutrition has been added to the required Curriculum of the School of Medicine. The Nutrition faculty have requested and received additional hours of core curriculum allocations each year. Particularly gratifying is the fact that in the second year of the program, two courses, Embryology and Neuroscience requested that Nutrition be introduced into their first year medicine courses. This introduction to Nutrition is planned to be a continuing program.
6. A distinguished lecture series in Nutrition has been inaugurated at MCG. The Nutrition program was able to bring to the campus outstanding speakers in different areas of Nutrition, thereby stimulating additional interest in the field. Because of the quality of the programs, it has been requested by the Chairman of Medicine that the programs be presented as Nutrition noon conferences or grand rounds in medicine rather than as nutrition

seminars. This would assure a much larger attendance of physicians as well as other interested health professionals.

7. The increased emphasis on nutrition stimulated the development of innovative and creative approaches to nutrition education. Computer simulations are being developed and utilized as a highly successful teaching-learning tool. Team presentations, seminars and rounds also provide exciting learning experiences for students.

8. The MCG Nutriton newsletter, *Food for Thought*, is published bi-monthly and distributed to all medical students, dental students, house officers, faculty of the Schools of Medicine and Dentistry, and off campus subscribers throughout the country. This newsletter describes MCG research, education and service programs as well as a multitude of national activities in nutrition.

9. Television programs in Nutrition are being developed in conjunction with the MCG television services. The programs will be in the form of a sereis of 30 minute segments designed for patient education. The first program on fad diets is currently in production.

10. The Nutrition Program is now involved with the community medicine course which teaches students utilizing home visits with patients. Some of the patients chosen for the students will come from the nutrition and lipid clinics and consult service. Several faculty preceptors for the course will be nutrition faculty.

11. For the core clerkship in medicine, the number of nutrition lectures have been doubled. Therapeutic diet lunches and enteral tastings have also become components of the medicine core clerkship.

12. Another area of curricular progress was in the physical diagnosis course. In the first year of the interdisciplinary grant, the nutrition faculty instructed preceptors in anthropometric measurements. The preceptors then taught first year students in their Physical Diagnosis course. Workshops were also held for the second year students to learn anthropometrics. By the second year of the grant, learning anthropometric measurements was a requirement for the Physical Diagnosis course.

13. As a component of the interdisciplinary grant, notebook binders were purchased and given to the first year medical students. This provided the students with a means of organizing the materials from the various nutrition handouts throughout their entire undergraduate medical school career.

14. The Nutritional Program participates in Prevention Day, a MCG activity that is part of the first year students' orientation session. The purpose of Prevention Day is to introduce the new medical students to the concepts of prevention **before** they receive their typical heavy emphasis on the disease processes. The Nutrition Program also assists with the provision of a prudent diet lunch that is compatible with the spirit of the occasion.

15. A continuing orientation activity that has become a part of Prevention Day is the inclusion of a student survey for hyperlipidemia. This student survey was inaugurated by a Nutrition Program faculty member a number of years ago and has since been adopted and required by many other medical schools.

16. With the growth and development of the Nutrition Program, fellowship training in Nutrition has been added as a part of the expanded activities. The first Nutrition fellow is currently on campus with the second about to join him this year. In addition the Nutrition Program is actively recruiting one or two fellows for next year.

17. The Georgia Institute for Human Nutrition, which was approved by the University System Board of Regents to serve as an umbrella for nutrition activities that are interdisciplinary, involves all of the departments of the School of Medicine and faculty in the Schools of Dentistry, Allied Health Sciences, and Nursing. A liaison member has been appointed from each department if no faculty are currently active in some aspect of nutrition education or research. These faculty receive the nutrition information that is sent out and also serve to provide the Institute with information concerning educational and research activities which may be nutritionally related. Through these efforts, several interdisciplinary nutrition research projects have been initiated.

18. The availability of a nutrition laboratory enhances the opportunity to present a higher quality nutrition teaching program. By applying the laboratory results to the evaluation of the patient and viewing the response to therapy, the importance of these tests becomes evident to the house officer or student.

19. Faculty of the Nutrition Program are active on the Nutrition Committee of the hospital. In the past two years some very positive outcomes occurred, such as:

    a. The development of a Total Parenteral Nutrition (TPN) order sheet. If house officers do not require or request consultation, they must fill their orders out on this TPN sheet and send them to the pharmacy by a certain time. If anything is amiss, the pharmacist notified the Nutrition Program faculty and steps can be taken to remediate the problem.

b. The Nutrition Program faculty have developed enteral policies which provide teaching for the house officers and nursing staff concerning tube feeding and the use of nutrition supplements.

c. The quality assurance program of the hospital looked into the question of nutritional assessment of cancer patients and found that nutrition services were not being requested. This was brought to the attention of a number of hospital committees and has resulted in further inservice education of physicians and nurses concerning nutritional assessment.

20. A most successful MCG continuing education program, Frontiers in Nutrition, has been enhanced by the interdisciplinary nutrition education grant. The program has been supported and sponsored by both the American Society for Clinical Nutrition and the American Society for Parenteral and Enteral Nutrition, as well as a number of pharmaceutical companies. Frontiers in Nutrition has been expanded and is now jointly sponsored by MCG's and Vanderbilt University's Schools of Medicine. The state of the art in nutrition is the prime interest in this program.

21. The MCG Medical School has increased its investment in nutrition within the Department of Medicine through the allocation of additional faculty and resources.

II. Challenges Encountered in Implementing the Interdisciplinary Nutrition Education Program.

1. The main challenge encountered revolved around the scheduling of the students. Each of the Schools of Medicine, Dentistry, Allied Health Sciences, and Nursing start and complete their academic calendars at different times. Great patience, interschool cooperation, and understanding had to be employed to effectively schedule the interdisciplinary elective so that the students were able to work together and satisfy the objectives of the program.

2. The difficulties of trying to integrate full-time and part-time elective students and also provide appropriate experiences for both were addressed with much planning.

3. As the training program progressed, not only were medical students as well as the other disciplines enrolled, but interns and residents were also incorporated into the program by the second year of operation. The residents were available only one afternoon per week and therefore fitting them into the program in a productive manner was certainly a challenge.

4. A major problem with Nutrition as an elective in the Medical School currriculum is that students are not required to take electives. Recently a new clinical clerkship in Neurology was added to the required curriculum thereby reducing the available time for electives. This available time will be further reduced when the Family Practice Clerkship is also added to the medical curiculum. The single most effective motivating factor in soliciting student enrollment in electives is word of mouth. It is anticipated that this medium will assist in the growth of the nutrition elective in spite of the aforementioned obstacles.

5. A continuing challenge that Nutrition at MCG encounters is a reluctance as well as an unawareness on the part of house officers and attendings of the role of nutrition evaluation and therapy in patient care. This problem persists even though for two years, the Nutrition team has provided consultation to all patients given total parentral nutrition (TPN) in the MCG hospital.

6. A multitude of nutrition activities that have been grant supported, such as the nutrition notebooks, interdisciplinary nutrition education elective, etc. will be forced to be phased out unless additional funds can be identified to support the program.

7. Although the Medical College has been generous in the initial allocation of space, the continued growth of the Nutrition Program has caused adequate space to house the activities of the program to become a problem. Additional facilities for educating patients and better quarters for full-time residents and fellows are major needs.

8. The perception of nutrition as a discipline with information important for the physician which he would otherwise not acquire without a structured nutrition curriculum — that perception is absent in the typical medical school.

The management of the Nutrition Curriculum can be much more efficiently and effectively accomplished with increased sensitivity and visibility of the topics. If the curriculum is developed in the appropriate manner — utilizing goals and objectives, sufficient curricular activities to enable students to accomplish those goals and objectives and an appropriate evaluation plan designed to provide information on the achievement of those objectives — the management of that program is greatly enhanced.

The awarding of educational or research grants in nutrition can enable the program directors to utilize the time, additional faculty, and increased resources to greatly improve a curricular program. In this paper, the authors have listed and described the multitude of benefits that the Nutrition Program, the students, the Medical College of Georgia, the faculty at MCG, and at other schools, as well as the federal government, have received as a result of grant funding for an Interdisciplinary Nutrition Education program. Further challenges are also discussed as potential directions in which Nutrition should move in order to have the curricular impact it deserves to have in schools of medicine in this country.

EVALUATION STRATEGIES FOR NUTRITION EDUCATION CURRICULA

Lawrence L. Gabel, Ph.D.

Evaluation is a term spoken often, a process constantly used, but a scheme not well understood. Over one hundred years ago, Abraham Lincoln phrased it well — If we could first know where we are, and whither we are tending, we could better judge what to do and how to do it. In the intervening years there has been much opportunity for development of educational theories, refinement of evaluative techniques, perfection of technology, and improved reporting systems. Still evaluation remains something as it was in Lincoln's day. People at all levels of expertise make most decisions intuitively. It may be true that some things will always be done intuitively.[1]

Be that as it may, how can we define evaluation? Evaluation is the process of delineating, obtaining, and providing useful information for judging decision alternatives.[2] Examining these terms more closely:

- Process — A particular continuing and cyclic activity subsuming many methods and involving a number of steps or operations.
- Delineating —Focusing information requirements to be served by evaluation through such steps as specifying, defining, and explicating.
- Obtaining —Making available through such processes as collecting, organizing, and analyzing, and through such formal means as statistics and measurement.
- Providing — Fitting together into systems or subsystems that best serve the needs or purposes of the evaluation.
- Useful — Appropriate to predetermined criteria evolved through the interaction of the evaluator and the client.
- Information — Descriptive or interpretive data about entities (tangible or intangible) and their relationships.
- Judging — Assigning weights in accordance with a specified value framework, criteria derived therefrom, and information which relates criteria to each entity being judged.
- Decision Alternatives — A set of optional responses to a specified decision question.

Whether recognized as such or not, evaluation is done as a decision-making service. It is a process which continues, is cyclic in nature, and has as its primary elements delineating, obtaining, and providing. The elements of delineating and providing are interface activities requiring collaboration between those responsible for evaluating and those responsible for decision-making. The remaining element, obtaining, is essentially a technical element which is the responsibility of those doing the evaluating. Figure 1 depicts how evaluation fits into the curricular process and how it impacts upon not only the design and implementation phases but also upon itself.

A number of persons have developed evaluation models; these include Robert Stake, Michael Scriven, Malcolm Provost, Daniel Stufflebeam, Marvin Alkin, and Ralph Tyber. Reference to the work of each allows one a means to decide which model would best suit one's individual philosophy and evaluative problem at hand. A useful comparison of these persons' models is provided by Worthen and Sanders.[3]

Although these educational theorists vary in the details regarding evaluation models, there are many commonalities. Here we deal only with those commonalities.

Definition of Evaluation — describing, comparing performance, and judging our educational program.

Purpose of Evaluation — to determine whether to terminate, to improve, or to maintain an educational program.

Key Emphasis of Evaluation — collection of descriptive and judgemental data for various audiences to use in decision-making.

Role of Evaluator — a specialist who is concerned with collecting, processing, and interpreting data.

Relationship of Evaluation to Objectives — a comparison of performance or existing conditions against standards to determine if a discrepancy esixts.

Relationship of Evaluation to Decision-Making — the source on which to base decisions about institutional, instructional, and behavioral dimensions.

Types of Evaluation — formative and summative in terms of systems assessment, program planning, program implementation, program improvement, and program certification.

Constructs of Evaluation — discrepancy concept with feedback for revision of goals, objectives, and the whole of the educational program.

Criteria for Evaluation — internal and external validity, reliability, objectivity, relevance, importance, scope, credibility, timeliness, pervasiveness, and efficiency.

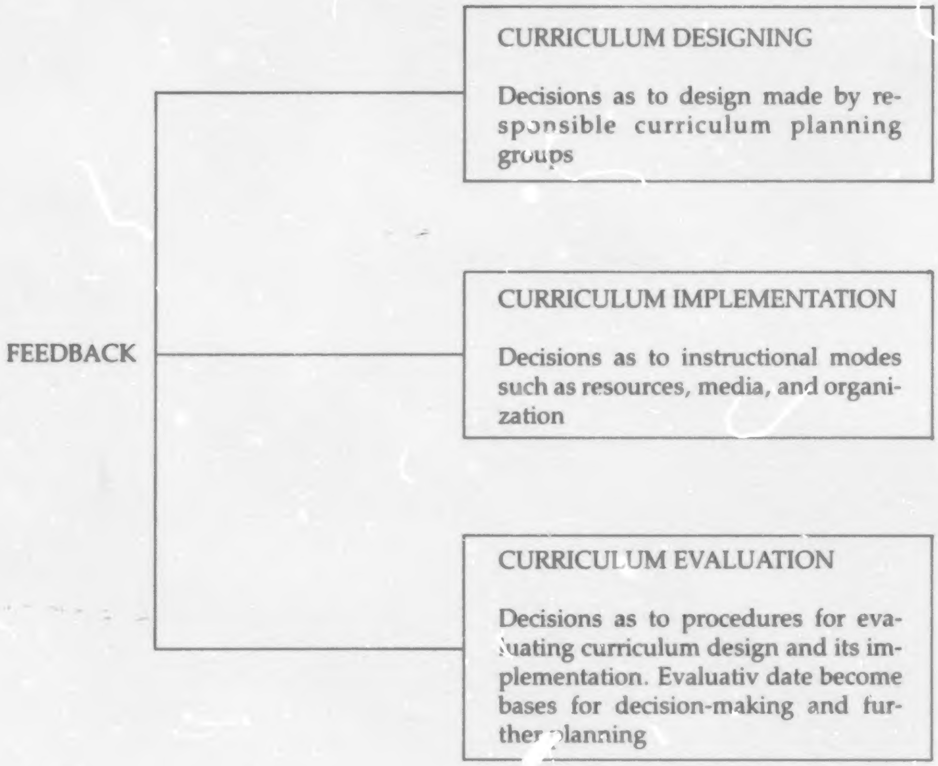
Implications for Design of Evaluation — (1) provides continuous feedback, (2) provides relevant and timely information, (3) provides a cost-benefit analysis, and (4) involves evaluation in program development.

Contributions of Evaluation — (1) provides a systematic method for arranging descriptive and judgemental data, (2) considers both absolute and relative judgement, (3) requires explicit standards, and (4) generalizability of a model.

Turning attention to application of evaluation models and evaluation processes to curriculum, six stages of development and evaluation of curriculum can be identified. These are depicted in Figure 2.

FIGURE 1

THE CURRICULAR PROCESS



CURRICULUM DESIGNING

Decisions as to design made by responsible curriculum planning groups

CURRICULUM IMPLEMENTATION

Decisions as to instructional modes such as resources, media, and organization

CURRICULUM EVALUATION

Decisions as to procedures for evaluating curriculum design and its implementation. Evaluativ date become bases for decision-making and further planning

The first stage in a curriculum project is to establish the philosophy and from this, the goals and terminal objectives. Evaluative studies are important at this stage to provide empirical evidence on the views of various interested parties; these may be students, teachers, practitioners, administrators, or others representing unique aspects of society. Data are collected on broad general levels making sure that each interested party is represented, however not necessarily equally so. Evaluation can be very intuitive at this level using judgements of panels of experts, existing documents, or needs assessments of the various interested parties.

After the philosophy, goals, and terminal objectives have been established, the planning stage begins. In this stage, learning or enabling objectives are identified or formulated, the scope and sequence of the curriculum is established, teaching-learning strategies are conceived, and instructional materials are designed. Evaluation at this stage is meant to provide some assurance that various teaching-learning activities will lead to the achievement of previously established goals and terminal objectives. Evaluative questions that need answering are related to determining that the learning objectives will lead to attainment of terminal objectives, that they are clearly

FIGURE 2

SIX STAGES OF CURRICULUM[4]

Stage	Roles of Development	Roles of Evaluation
Determination of General Aims	Philosophy Goals Objectives	- Expected Changes - Cultural Values - Social Forces - Present Level of Achievement - Feasibility of Program
Planning	Writing Outlines Preparing Instructional Materials	- Examining adequacy of objectives, contents, strategies - Judgement of material
Tryout	Monitoring teaching in tryout classes tryout classes Modifying Material	- Collect data from observations, judgements, teachers, and students - Student Products
Field Trial	Modifications Determine Optimal Conditions of Program Use	- Select Sample - Collect evidence about efficiency of program under various conditions
Implementation	Links with supervisors, examination system, teacher training	- Examining final form - Evidence on efficiency of system links - Evidence of efficiency of teacher training
Quality Control	Implement second generation programs	- Examination of quality of implementation - Studying reasons for changes in efficiency - Suggesting remedies if needed

stated, are measurable, and are appropriate and attainable by the learner. Evaluation of the scope and sequence assesses relevance of content to the objectives, its up-to-dateness, relevance to the learner's past and future experiences, balance, and organizational structure. Instruments should be simple, yes/no response-type, rating or ranking scales, or open-ended questions. Evaluation related to teaching-learning strategies and to the instructional materials is most often accomplished through task analysis. This involves detailed analyses of the hierarchical structure of the task or concept to be taught to assure that the learner is prepared for the new learning.

In the tryout stage, the task is to determine what kinds of evidence can be gathered to determine adequacy of the educational materials and what revisions are necessary. Three basic types of data are required: judgemental, observational, and student learning. Judgemental data may be sought from experts such as teachers or supervisors or even the learners themselves. Judgements are sought as to which aspects of the curriculum are effective and which are not and are in need of revision. Observational data can be collected of the teaching-learning situation by observing interactions between teachers, learners, materials, and procedures. Are the conditions of instruction and are the learner responses appropriate? To what degree are the learners involved? What problems are the teachers encountering? Regarding student learning, tests are most useful primarily of the criterion/referenced nature. This allows one to relate what is or is not learned to the portion of the curriculum that was intended to teach. A basic requirement is that the tests are well constructed and are designed in accordance with the new curriculum.

In the field trial stage, evaluation is a broad basis in an attempt to test conditions similar to those of widespread use of the new curriculum. This determines conditions under which the educational program will work and those under which it will not. Contrary to the tryout stage where few students or classes are needed in this stage the sample is large and should be drawn randomly and stratified to ensure representativeness of the universe. Data should be collected on a pre/post basis to allow a comparison of entry versus exit behaviors. Instruments should be standardized, be high in validity and reliability, and developed from a statistical perspective. Designs should be used such as those outlined by Campbell and Stanley.[5] Often a control group is used although it is difficult to make meaningful comparisons between new and old curricula; it is extremely difficult to construct tests that are equally valid for the different curricula. The more important comparison is of outcomes of the new curriculum used in different situations or under varying conditions.

In the stage of large scale implementation, evaluation becomes more diffuse. Primarily, there are three aims. First, one wants to document conditions that favor effective use and not so effective use of the new curriculum. Second, in given situations, one attempts to determine what it is that individuals are trying to change or achieve in having adopted and implemented the new curriculum and whether or not the changes are occurring. Third, after implementation has occurred in various settings, what support, inservice training of teachers, or adaption of the materials are necessary for the educational program to function most efficiently and effectively? The techniques to accomplish these three tasks are numerous, but interviews, questionnaires, comparisons to other similar programs, and analysis of the logistics involved in management of the program are helpful.

In the quality control stage, attempts are made to determine if the new curriculum is remaining effective, if it is improving as persons become more experienced with it, or if it is deteriorating. Identifying effectiveness and deterioration can be accomplished through comparisons of base-line and current data. Standardized tests may be useful in this stage especially those that are norm-referenced. Interest and attitude scales administered to both learners and teachers are helpful. Unobtrusive measures such as library records, enrollment data, attendance data, or antecdotal information may be useful. Teacher variables are important to examine especially if deterioration is in evidence. Examples of these are morale and motivation, perceptions and attitudes toward the new curriculum, perceptions of roles in teaching the new curriculum and understanding of content in the new curriculum.

To conclude, what advice can be given regarding evaluation? Use a common sense approach to any evaluative situation matching needs with resources keeping the latter uppermost in mind. The adage related to computers — garbage in, garbage out — is just as true in evaluation. Remember there are three basic elements to evaluation. First, one must clearly delineate the need of evaluation and the basis upon which the evaluation will occur. What are the criteria? Next, obtain the data with instruments which are relevant and valid. In many cases, this will mean developing the instrument to match the situation. Data collected are only as good as the instrument is valid and reliable.

Finally, after judgements are made, implement these by readjusting the curriculum to take full benefit of the evaluative process.

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INTERPROFESSIONAL* COLLABORATION AND EDUCATION

Sylvia K. Fields, Ed.D., R.N.

I. Introduction

The interprofessional team approach to delivery of health care is by no means a new innovation and students of the health professions have in many situations had incidental or even planned learning together, especially in clinical settings.

The team approach is based upon the concept of collaboration which relates to utilization of problem solving techniques as individuals work together for common goals. When members of several practicing professions seek to define goals of mutual concern and to develop mutually satisfying working relations in implementing these goals, interprofessional collaboration occurs (Vollmer and Mills, 1966). Collaborative practice theoretically allows the health care professionals to function more effectively to meet the complex needs of the client as emphasis is placed upon comprehensive health care services for each consumer. "Collaboration among the different health professions becomes an almost absolute necessity not only to meet the needs of the people by integrated understanding of their problems, but also to allow the various professionals to become familiar with the many complimentary techniques related to or connected with the practice of their profession." (Brunet, 1971). This has become even more important as roles have expanded, and new roles developed, often overlapping and blurring, such as the Nurse Practitioner and Physicians Assistant.

However, just calling a group of professionals a team in no way guarantees that they function together as a team, that there is more effective health services provided, or that each practitioner feels personal satisfaction from his efforts. "While several professionals may address individual problems, unless there is mutual respect among colleagues with coordination and communication of necessary information, fragmentation of the various services frequently results." (Ducanes and Golin, 1979).

Unfortunately, "in some cases early enthusiasm has been followed by disillusionment as the difficulties inherent in the team approach became apparent." (Ducanes and Golin, 1979). The basic cultural values of each health profession, especially deeply rooted in those of long standing such as medicine and nursing, often appear to interfere with efforts toward effective team work. Multiple factors may intervene, such as: difference in educational preparation, legal responsiblity, sex roles, stereotypes of relationships, social structure and status, role ambiguity, incongruent goals and expectations, and personality factors, as well as the very definition of "profession" which implies autonomous practice (Cottrell and Sheldon, 1966).

Although there has been much said about the need for interdisciplinary work among professionals, "rarely do we find a clear analysis of why such interdisciplinary collaborative work is so infrequent and so difficult." (Shein, 1972). What we do know is that given the obstacles identified above, individual professionals often need special preparation in order to function as a team. Team development methods and continuing education have been proposed in order to prepare health professionals for effective team roles, but more frequently it has been recommended that basic educational programs assume responsibility for developing appropriate interprofessional learning activities (Ducanes and Golin, 1979). "If health professionals are to work together they must also learn together." (Szasz, 1960).

However, the education of different health professional to work as health teams is truly a challenge for our educational institutions since the tradition of our medical world has not moved in this direction. Traditionally the responsibility for the training of different health workers has remained scattered among such unconnected organizations as medical schools, liberal arts colleges, allied health schools, and hospitals. Physicians, dentists, nurses, and dietitians all have difficulty in adapting their training programs to facilitate interprofessional student learning during the formative years. Students have rarely shared classrooms and each profession has usually planned its own independent clinical rounds.

Despite all that has been written espousing efforts towards interprofessional collaboration in health care practice and education, relatively few significant programs have been established and evaluated as being worth the time, effort and money, or truly effective in improving health care delivery. The literature has certainly not been filled with documentation of successes and true research has been at a minimum. At the same time we do know that many of those programs which have been developed have usually been for small numbers of students, required extensive planning time, created scheduling conflicts, been very expensive to maintain, have offered the faculty few academic and personal rewards, and have therefore

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**Interprofessional and interdisciplinary will be used synonomously but refers to 2 or more individuals representing different professions, i.e., Medicine and Nursing.*

not withstood the pressure of terminated funding from outside. It is no surprise therefore that given the very real constraints of traditionalism, professionalism, elitism, and pure economics, interprofessional education has not established itself within the mainstream of professional education in this country.

It is in the milieu that nutritional practice and education has been proposed as an appropriate area for interprofessional activities. At the workshop on Interdisciplinary Education in Applied Nutrition held at Emory last year Tom Connelly stated, "Nutrition is a field of endeavor which stands out as one poised on the brink of excitement in fostering interdisciplinary activity. Each of the clnical health professions must consider nutrition essential to its knoweldge armament. Therefore, the nutrition educator is presented with a magnificent opportunity to serve as a catalyst to bring together the disciplines for at least a lingering moment, in a true working, interdependent and collaborative setting."

Despite all the problems identified, in certain settings, with certain professional practitioners, and under certain circumstances true interprofessional collaboration may occur. The health care team certainly deserves recognition when it is effective; however, before we jump to the conclusion that nutrition education itself must be collaborative and that collaboration requires a traditional health team model, perhaps we should ask some serious questions regarding interprofessional collaboration and education generally, and then specifically regarding the theme of nutrition education.

My questions are:

Will the health care team as we know it survive in the 21st century, or will we see new approaches emerging among diverse professionals, consumers, and other non-traditional health care providers?

If we are to have teams, how can we prepare faculty to be role models of team excellence for students?

Can students learn the skills for team work within the confines of their brief educational experience in professional schools?

What will be the effect of new technology, especially the computer, in providing interprofessional assessment and management of health care problems?

What are our priorities in developing strategies for basic professional education as the curriculum explodes?

How can we help practitioners learn best when to collaborate, how to collaborate, and with whom?

II. Historical Background

In the early 20's the psychiatrist, social worker and psychologist were known to fucntion as a team in mental health (Ackerly, 1947). During and after World War II the concept of the rehabilitation team took shape with representatives of certain specialties within medicine, nursing, psychology, physical therapy and nutrition among those planning for therapy. Based upon the underlying theme of treating the "whole client" and acknowledging that "problems presented by the client are interrelated and cannot be treated in isolation, team membership varies according to the problems presented, and the staff available, with consultation sought from other professionals not serving full time on the team. For example, although physicians have always consulted with dietitians regarding the nutritional needs of certain clients, today metabolic support teams, including dietitians, have developed in many medical centers across the country. Clinical dietitians have joined the basic diagnostic team in certain institutions when particular interest has been generated either by an individual physician, by institutional policy or by virtue of criteria established by outside funding agencies.

In response to the need expressed for students to learn together, a variety of individual courses or major projects have been developed across the country during the past 10 years. A survey conducted by this author in 1975 to determine the extent to which such programs had been developed at the professional level for baccalaureate nursing students revealed the existence of over 50 interprofessional courses (Fields, 1977). Didactic courses titled identified included, "The Health Care Team — Roles and Conflicts," "Doctor, Nurse, Patient Relationship," "Multidisciplinary Health Care," and "Health Care Professions." Clinical courses offered included "Primary Health Care," "Physical Diagnosis" and "Rehabilitation."

The most commonly offered interprofessional course, however, was "Human Sexuality" where nursing and medical students shared the classroom. One can speculate that "sexuality" lends itself to interprofessional learning apparently because in this case, objectives for each profession can best be met through a mixing of the sexes, the different groups start with essentially the same limited knowledge base, and the number of qualified faculty to teach this content is limited.

A few examples of planned interprofessional educational programs have been described in the literature with emphasis placed upon development of the "Health Team Method." Objectives such as learning each other's roles, improving communication, appreciating each other's professional contributions and joint problem solving for clients in actual health care delivery settings were addressed.

Faculty and student evaluation of the early development of one program in California identified two main problems. They believed that for the most part **traditional** clinical settings (ambulatory clinic) were not

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appropriate for team method education, for their policies and procedures interfered with the development of collaborative work relationships. Another main problem was that faculty from medicine and nursing had not had sufficient time and opportunity to develop together joint learning objectives and teaching methods before the student arrived. The faculty also recognized the need to provide joint learning experiences earlier in the curriculum appropriate to each level of the professional programs. Although secondary funding established a primary care clinic especially developed for interdisciplinary practice, the problem of developing "joint planning" still created conflicts which the faculty found difficult to alleviate (Rosenauer and Fuller, 1972). What was certain was that to accomplish "joint planning" both medical and nursing students needed to change behavior that had been a basic component of their professional socialization process. The medical student had to learn to share with the nursing student the responsibility for determining patient care needs, and the nursing student had to accept responsibility for planning patient care rather than exclusively following physicians' directions. Faculty and students made a special point of stressing that before medical and nursing students can learn to work collaboratively with each other, faculty from each discipline must learn to work together.

A series of similar projects conducted in various parts of the country for primary health care team development have been described in the literature (Connelly, 1975; Dana, 1969; Jones and Dunn, 1974; Madison, 1968; Szasz, 1960; Tanner, 1972). Some significant comments can be made in relation to each of these.

One project at the University of the Pacific in California was designed exclusively for graduate students: primary care medical residents, primary care dentists, nurse practitioners, clinical pharmacists and graduate social workers and health care coordinators. The similar level of role sophistication for each practitioner was apparently a major strength of the interprofessional activity.

In the New York school, medical students were assigned to multiprofessional task forces composed of students and faculty of Social Welfare, Nursing and Allied Health professions to study "Comprehensive Patient Care Management." Experiences were initiated when "students know enough about the role requirements for their own professions to have a sense of professional identity — to help the student "to act together not necessarily think alike." (Dana, 1969).

In the evaluation of one major project, "students claimed they never did really see a professional team functioning and, therefore, could not observe it as a model team to learn from, not from practitioners, not from faculty."

Major efforts for interprofessional learning have been developed at many health science centers through administrative decree. Courses have been developed and learning strategies designed which appear exciting.

Unfortunately, medical school faculty have always had difficulty in agreeing to the requirements and medical students have had little interest in interprofessional courses. They claim they don't have the time to give up from their required studies and their learning may be diluted. (Apparently medical students come to school with preconceived attitudes toward interprofessional learning — mostly negative — especially among the men (Rezler, 1978). Although some with special interests, i.e., primary health care, do recognize the values of interprofessional study, the pressures of the basic health science program seem overwhelming during the early years. Their priorities are established there, for it is a matter of survival.

In relation to the major concern of this workshop there have in the past been efforts towards interprofessional learning focusing on nutrition education for medical students. At Emory in 1974 and 1975 an interdisciplinary course, "Clinical Nutrition" was required for sophomore medical students and dietetic interns with first year nursing students sharing some learning experiences, i.e., visiting diabetic patients with the team and attending lectures related to the visit (Baumslag, Gatins, Watson and England, 1976). The course was concerned with the practical aspects of diet prescriptions, dietary customs, attitudes and behavior modification. Among the objectives were to enable the students to work as a team to evaluate and apply practical dietary information; take a dietary history and analyze the food content; clinically assess nutritional status; utilize and interpret anthropometric measurements and certain biochemical values, prescribe a diabetic diet and evaluate the effectiveness of the prescription with the patient in the home. The instructional format included a pre-test to assess students' basic biochemistry and nutritional knowledge followed by lectures, a bibliography and handouts, laboratory sessions, a home visit, and a tasting luncheon.

The faculty concluded that nutrition education needs for different professions vary; therefore, medical, nursing and dietetic students shared some experiences and were taught other separately. The collaboration among students was sufficient to allow them to learn something about the other health professions. However, due to personnel changes and scheduling difficulties this course was not continued as an interprofessional effort.

III. Developments

In 1979, thirteen interdisciplinary projects were funded by the Health Resources Administration for

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curiculum development in applied nutrition. These projects have been as diverse as the institutions awarded the grants. Although some activities have been somewhat similar, i.e., the development of clinical nutrition elective courses for mixed groups of students and audiovisual production of programs for independent learning, such as the slide tape program on nutritional assessment, some activities have been quite unique, such as the preparation of computerized simulations of common patient management problems. Nutrition education has been the vehicle for development of interprofessional student and faculty teams to assess and manage patients with common health problems with nutritional implications including case studies written as discussion stimulators. Students have attended multidisciplinary conferences and patient rounds, participated with faculty as consultants in evaluation and follow-up of inpatients and clinic patients and experienced a variety of teaching lunches. Various publications and newsletters have been prepared to support interdisciplinary communication.

In addition, patient education materials have been developed for use by several professionals such as "Shape Down: Weight Management for Adolescents," a self-study weight loss program for adolescents used to train students and house staff to counsel obese adolescents. Several new courses have been developed in clinical nutrition as well. One school developed a rather sophisticated program to evaluate interviewing and management skills of students as members of interdisciplinary teams using simulated patient situations. In addition, a variety of special lectures, workshops and seminars have been held on the different campuses as a result of the initiative provided through this grant opportunity.

Emory conducted a survey of students, graduates and faculty as well as faculty of other schools to develop and validate a listing of professional competencies in nutriton necessary for practice within Medicine, Nursing and Dentistry. Students and alumnae evaluated their course work in terms of what was expected in practice. As a result existing courses in each of the three schools were reviewed and revised appropriately.

A new interdisciplinary elective course in applied nutrition for students of medicine, nursing, physicians associate and dietetic programs was developed and offered this past spring at Emory University. The purpose was to enable students to apply nutrition principles to clinical situations and to interact professionally with other members of the health care team. Nineteen students participated in the lecture seminar course which included assignments to teams to present patient management problems and one clinical experience conducted at the Emory Hospital Clinical Research Facility.

A variety of evaluation procedures were used to gather information about the degree of success of the course in relation to understanding and attitudes in applied nutrition and attitudes and skills in teaming. Criteria of team work, such as task orientation, role definition, goal development, collaboration and relationships were addressed. Generally, the students appeared to feel the teams did not adequately perform as a team nor meet the objectives of the task given the teams, although they were extremely positive about the teaming approach in nutritional study and care. Ratings by outside professional observers of team effectiveness indicated a consistent non-collaborative nature of the team activities. Members tended to work alone rather than collaborating and members appeared to withdraw from the team's tasks and functions. "The teams really functioned as separate persons working on the same problem but not working together on the problem." Undoubtedly these effects most likely resulted form the very nature of the course, with little actual demonstration of teaming by faculty.

Summary evaluations, however, indicatd that there was considerable positive change in attitude toward the application of nutrition to health care practice. The majority of students expressed the feeling that they derived benefits from working on the case studies, and all recommended that the course be taught again. At this time plans to repeat the course next Spring with some recommended revision are being projected despite the elimination of federal support.

IV. Implications

Interprofessional collaboration requires the willingness and maturity to share, to adapt, to listen, to communicate directly and openly about one's feelings, thoughts and differences, and to be sensitive and responsive to one another's expectations (Aradine and Predham, 1973). However, not all professionals are at the same level of professionalism and, the traditional model of professional education puts so much stress on the professional as an autonomous expert whom the client can trust because of his high degree of skill and commitment to a profession that we may have trained out of most of our professionals the attitudes and skills that are needed to work in collaboration with others (Shein, 1972).

Meanwhile, the need for communication, consultation and collaboration will undoubtedly increase during the 21st century as technology and knowledge continue to expand, but the players may be different. The patient/client will undoubtedly demand a greater role in decision making as he assumes more responsibility for promotion of his own health, often utilizing health care modes and modalities out of the mainstream of traditional medicine with the assistance of a variety of non-professionals or semi-professionals who will need to fit into the team. This is especially true when we consider nutrition.

We must look at how we socialize our students to their professional roles and then perhaps consider some changes in that process. At the same time we must recognize that professionalization does not become complete on graduation day, but rather that socialization to the profession, whereby an individual assumes a professional image which becomes a very significant aspect of his self concept includes both formal education as well as the experiences after graduation from a professional school.

The development of this professional self concept involves a complicated chain of perceptions, skills, values, and interactions. In this process a professional identity is etched which is believable both to the individual and to others and particularly strengthening to the professional self esteem and self realization, leading to the ultimate criterion of professionalization, achievement of "Autonomy." During the process of professionalizaton, the final process, often after great conflict, is the establishment of effective working relations with members of related professional groups (Caplow, 1954).

We can predict, therefore, that interprofessional collaboration may be achieved only when each respective professional is safe and secure in his own professional role, which should lead us to recognize the difficulty in teaching students to function collaboratively on health care teams especially.

It has been proposed that if professional socialization can occur in an atypical manner, collaboration may be a less threatening achievement. It is to this goal that efforts for interprofessional education are made, and, therefore, it becomes apparent that interprofessional learning must occur in a sequential manner over an extended period of time, paralleling the learning pogress within each profession if it is to be meaningful. (Turnbull, 1981).

V. Recommendations

If we recommend that education prepare for interprofessional practice, and perhaps education itself be carried on in an interprofessional model, then we must recognize that faculty must be prepared to demonstrate to their students a model of interprofessional behavior. However, lacking exposure to an interdisciplinary approach in their own education, educators are often extremely insecure and unwilling to participate in interprofessional teaching. A profound change in attitudes, values and behaviors is often required. It is unrealistic to expect any educator to move from a mono-disciplinary approach to education to an interdisciplinary approach without systematic preparation. (Wieczorek, Pennington and Fields, 1976).

Therefore, if we are to expect to implement interprofessional learning activities for students, we must first develop programs and practice teaching situations whereby selected educators will be able to learn how to function effectively in an interprofessional teaching situation. It is apparent that all health professional educators do not need to be so prepared, all don't want to be so prepared, and the cost in terms of time and money should be considered carefully. However, if we had centers for team development training and continuing education programs, selected faculty could become prepared along with other practitioners who need to utilize team concepts.

If we hope to begin to prepare students to work as teams, we must focus on this concept early in the program. When it is appropriate, begin with a description of team roles and functions for the health professions, explaining the roles and functions of the students' own professions, and describing the roles and functions of other related professions.

This may sound very simplistic but some suggestions include:

1. Inviting experienced practitioners on faculty of the different professional schools to speak. Since roles are changing it is important to hear from the individual directly.
2. Using a videotape demonstrating a health care team composed of these professionals as they discuss patient/client problems and develop plans for management together; or having the interprofessional faculty team demonstrate collaboration with a real or simulated patient situation in front of the class.
3. Promoting social and recreational activities for faculty and students, i.e., mixed tasting luncheon, softball game, bowling party, open house, etc. Don't underestimate the significance of promoting social and recreational activities for faculty and students, especially if students don't take the initiative. It is much easier to learn to work on a team with "friends."

As students progress in the curriculum, electives could be offered in areas of special student interest. It is probably best to select an area for interprofessional learning where the objectives of the course for each profession can perhaps best be met through interprofessional teaching activities, such as the Social Science areas, i.e., Human Sexuality, Biomedical Ethics, Death and Dying. Students must do more than just sit in the classroom with other health profession students. Unfortunately sitting in the classroom guarantees nothing unless the strategies for teaching provide models and give students sufficient time for practice in joint problem solving with guidance (Szasz, 1960).

Interprofessional courses in applied nutrition may or may not be effective unless students are ready for collaboration. Expecting students to team problem solve in clinical nutrition is probably unrealistic unless they are especially sophisticated and led by well seasoned faculty highly committed to interprofessionalism. It is more important that students learn the essential concepts and skills related to their own professional roles; what questions to ask, what signs to look for, how to share information, when collaboration is necessary, who to collaborate with, and that they will probably need help in learning how to collaborate.

Certain health centers and educational units should become especially well prepared and committed to serve as models for interprofessional practice and education in Nutrition. Development of expertise in team functioning and training for study and management of nutritional problems could occur in these centers. Video programs could be prepared by these experts to document and establish the procedures and methods evaluated as most effective for interprofessional collaboration and education. Practitioners, faculty and students from other institutions and agencies could come to the center for special training and education. Computer programs for assessment and management of problems in nutrition such as the ones recently developed by certain interdisciplinary projects could be tested and made available to practitioners across the country. We would have the benefit of the knowledge of the most expert health care team available with much greater opportunity for quality health care practice.

Imagine the cost effectiveness if we don't need the traditional "team" in every center, yet have access to the knowledge of a team of experts!

VI. Conclusions

With an ever increasing knowledge explosion in medicine and health, it becomes apparent that the basic education of physicians and other health professionals must focus on what is most important to learn during the formal education experience and leave what can be best learned later to post graduation experiences. "Medical schools must begin to define their limits. They cannot be institutions for all seasons." (Reynolds, 1980). Barondess in an article titled, "The Future Physician: Realistic Expectations and Curricular Needs" in the **Journal of Medical Education**, this year, imposes the need to establish priorities within a packed curriculum with special attention given to developing a scientific mind and clinical skills (Barondess, J., 1981). My co-author, Dr. Jacques L. Sherman, Jr., former Professor of Medicine, State University of New York, Stony Brook, Dean of the Clinical Campus and Associate Chief of Staff for Education, Veterans Administration Hospital, Northport, N.Y., always said, "If only we could teach the medical students to take a good history and do a good physical examination."

Barondess recommends further that we provide students with computer techniques, not only for literature review, but also for consultative help with specific clinical problems while maintaining the curricular emphasis on the human support function so necessary to humanistic care (Barondess, 1981). It is perhaps more important that we focus in our programs on preparing each health professional with the skills necessary for beginning independent practice and plan to prepare him for collaboration when he is ready, through continuing education and on site team training (Ducanes and Golin, 1979).

We believe that the health care team can be a valuable contributor to worthwhile comprehensive health care delivery. However, we need more research to evaluate the impact of interdisciplinary practice and educational methods on the health of the public and on health professionals (Magraw, Fox and Weston, 1978).

And again let me stress that basic education programs cannot be expected to prepare students for interprofessional collaboration unless the faculty are first prepared to serve as role models.

Raising questions regarding interprofessional collaboration and education seems almost like heresy for me. I have been a strong believer in the values inherent in the concept recognizing that much of my finest and most meaningful professional education was received either through interprofessional activities or during interprofessional educational experiences over a lifetime. However, that is exactly the point; that learning has been planned yet spontaneous; encouraged yet questioned; independent although collaborative, ongoing throughout my formal and informal professional education and practice. As a result it has been meaningful and effective.

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NUTRITION AND HEALTH SERVICES — DIRECTIONS FOR THE 80's

Lenora Moragne, Ph.D., R.D.

I. Introduction

It is a pleasure to be participating in this very significant and timely conference planned to provide a forum for viewing the existing nutrition education curricula, methods and materials for use in health professions schools, and convene an expert panel to develop a consensus report on future demonstration projects.

Listening to the presentations and discussions recalls the fall of 1978 when I had the opportunity to staff hearings of the Senate Nutrition Subcommittee on the subject of "Nutrition Education in Medical Schools." Congress was interested in learning more about the status of nutrition instruction in the nation's medical schools, the need for such instruction, and any problems interfering with effective curriculum implementation. The Senate had already taken steps to provide funding for nutrition in medical education. The Congressional intent was to insure that recipient institutions require satisfactory completion of a nutrition course by all students as a condition of graduation. Yesterday was indeed rewarding in that first hand one heard more about the many unique and diverse activties which appear to be successfully addressing the intent statement mentioned above. I sit here and only wish that some of the Senators who worked so intently for the 788 (d) funding[1] — Senators Bellmon, Dole, Magnuson, McGovern and others — were able to hear about the fruits of their deliberations.

Today, I have been asked to address the topic "Nutrition and Health Services — Directions for the 80's." In recent weeks I have given serious thought to the assignment; thinking about exactly what directives and policy documents, guideposts have been adopted to provide direction in addressing nutrition in the 1980's, particularly as it pertains to nutrition education in medical schools. I have identified five specific areas which I feel will be emphasized in our nutrition thrusts over the next decade.

II. DHHS Nutrition Coordinating Office

First, let me digress here to say that over the past couple years I have had the privilege and great pleasure to work with three outstanding physicians who have each contributed greatly to departmental policy in nutrition. I know they have many friends and acquaintances among today's audience: Dr. George A. Bray, now Professor of Medicine and Chief of Diabetes and Nutrition at the University of Southern California at Los Angeles; Dr. C. Wayne Callaway, Director of Nutrition Services at Mayo Clinic; and presently Dr. Theodore B. Van Itallie, Director of Obesity Research at St. Luke's Roosevelt Hospital Center in New York City and Professor of Medicine, College of Physicians and Surgeons, Columbia University.

The Department's Nutrition Coordinating Office directs and coordinates nutrition policy and activities in six broad areas: nutrition education, nutrition research and research training, nutrition services and manpower, nutrition surveillance and monitoring, international nutrition, and food quality, safety and regulation. Department-wide committees have been established around each of these areas, with a senior level government official chairing each committee. In addition to these six units, there is a Nutrition Policy Board which is comprised of the Assistant Secretary for Health or his designee, the six committee chairpersons, the Human Nutrition Policy Advisor (a physician), and myself. Finally, there is the DHHS Nutrition Coordinating Committee where representatives from some two dozen offices and agencies meet every other month or so to address issues and share information about nutrition.

The DHHS Nutrition Coordinating Office headed by the Human Nutrition Policy Advisor has been directly involved in spearheading several activities since its establishment in the fall of 1978:

- In September 1979 the Office coordinated a National Conference on Nutrition Education which was sponsored by DHHS, USDA, the Office of Science and Technology Policy of the Executive Office of the President, and the Society for Nutriton Education. The two day meeting addressed the felt and unfelt nutrition education needs of major segments of the American population: persons with diet related diseases; the general public; pregnant and lactating women, infants and young children; low income groups and the elderly.
- In February 1980 DHHS along with USDA issued the Federal dietary guidelines. The development and DHHS distribution of the publication, titled: *Nutrition and Your Health — Dietary Guidelines for Americans*[2] was handled through our Office.
- In observance of National Nutrition Month, March 1981, the Coordinating Office sponsored a Symposium for the Washington, D.C. community which addressed three timely topics in nutrition: heart disease, obesity, and the essentiality and safety of nutrients. Secretary Schweiker reiterated

his commitment to nutrition before this gathering.

- The Office is currently coordinating the development of three very important nutrition documents: a consumer booklet on obesity being prepared in conjunction with the Nutrition Foundation and the Consumer Information Center, an annotated bibliography of all DHHS nutrition education publications targeted at the general public, and a manuscript designed to help health care professionals more completely and adequately interpret the nutrition and health impacts of food intervention programs.

III. Nutrition Directions for the 80's

Now let me turn to my assignment, reflections on the direction of DHHS nutrition activities in the 80's; namely emphasis on nutrition as a cornerstone of prevention, comprehensive nutrition status monitoring, improved health behavior surrounding pregnancy, nutrition education research, and block grant as a funding process for nutrition and other health services.

1. Nutrition Objectives and Prevention

In 1979 the first Surgeon General's Report on Health Promotion and Disease Prevention, titled **Healthy People** was issued. It presented the dramatic gains in the health of the American public, reviewed present preventable threats to health, and identified fifteen priority areas of which appropriate actions could lead to further gains over the next decade. **Healthy People** outlines broad national health goals for five major groups of the population: infants, children, adolescents, adults, and the elderly.

A follow up document to **Healthy People** is titled **Promoting Health/Preventing Disease: Objectives for the Nation**[4] and it outlines specific and quantifiable objectives necessary to attain the broad 1990 goals outlined in the Surgeon General's report. Nutrition objectives represent one of the health areas identified; other objectives related to nutrition include high blood pressure control, pregnancy and infant health, physical fitness, and exercise.

Among the seventeen objectives designed to improve health through nutrition measures are several of particular interest to audiences concerned with nutrition education in medical training:

- By 1990, the proportion of pregnant women with iron deficiency anemia (as estimated by hemoglobin concentrations) early in pregnancy should be reduced to 3.5% (In 1978, the proportion was 7.7%.)
- By 1990, 50% of the overweight population should have adoped weight loss regimens, combining an appropriate balance of diet and physical activity.
- By 1990, the average daily sodium ingestion (as measured by excretion) by adults should be reduced to at least to the 3 to 6 gram range.
- By 1990, the proportion of the population which is able to identify the principal dietary factors known or strongly suspected to be related to disease, should exceed 75% for each of the following diseases: heart disease, high blood pressure, dental caries, and cancer.
- By 1990, 70% of adults should be able to identify the major foods which are low in fat content, low in sodium content, high in calories, good sources of fiber.
- By 1990, sodium levels in processed food should be reduced by 20% from present levels.
- By 1990, virtually all routine health contacts with health professionals should include some element of nutrition education and nutrition counselling.

To implement these objectives and assure their achievement by 1990, every effort will be made to join forces with the private sector, such as assistance from business and industry groups, academia and consumer groups, and voluntary and professional organizations. The department is soliciting the active assistance and support of each of you as individuals and as members of organized bodies to join us in this national effort.

The department along with other Federal agencies will play the lead role in implementing the objectives through activities such as developing and implementing consumer education programs rendering nutrition services at the Federal and State levels and conducting research to further understand the relationship between nutrition and health. Of course, the ability to engage in all these efforts is contingent upon the availability of Federal fiscal manpower resources. If sufficient resources are not available, only those Federal efforts ascertained to produce the most progress toward achievement of the objectives will be supported.

2. Comprehensive National Nutrition Monitoring

The emphasis on nutrition assessment will continue to receive a major emphasis in the eighties. Earlier this month Health and Human Services sponsored a major conference on nutrition assessment, designed to highlight the current state of the art in the assessment of nutritional status.[5] Emphasis was placed on currently available methodology, its adequacy and shortcomings and most importantly on the identification of research needed to develop adequate methods for nutritional assessment. Attention was also given to the evaluation of the nutritional status of individuals, including surgical patients, infants, patients with malignant or cardiovascular diseases and obese individuals undergoing weight loss.

Also, this week DHHS and the Department of Agriculture completed and submitted to Congress a comprehensive national nutrition monitoring document which contains an implementation plan and a summary of current prospective efforts to monitor the dietary and nutritional status of the U.S. population.[6] Data collection outlined in the plan covers measurements in five basic categories: health status, food consumption, food composition, dietary knowledge and attitudes, and food supply. DHHS' National Health and Nutrition Examination Survey (NHANES) and the USDA Nation-wide Food Consumption survey (NFCS) make up the two primary systems of the monitoring endeavor.

DHHS' activities in this plan emphasize health status and the relationship of health to nutrient intake while USDA's portion emphasize dietary status, the relationship of diet to socioeconomic factors, and assurance that U.S. food supplies will meet the nutrient needs of the population.

In addition to achieving the best possible coordination of thesee two systems a primary objective of the Plan is to develop a reporting system to translate the findings of NHANES and NFCS to periodic reports to Congress. The two departments will be appointing a coordinating committee to oversee the operation of this national monitoring system. It should be pointed out that the Plan does not address an assessment of food assistance programs like food stamps or school meals.

3. Healthy Behavior Surrounding Pregnancy

One of the health objectives for the nation for the 1980's stated in **Healthy People** is to continue to improve maternal and infant health — to help achieve the goal of reducing infant mortality to fewer than nine deaths per thousand live births by the year 1990. Reducing the risks to the infant through intervention with the mother before and during pregnancy is a high priority in the department's preventive efforts for promoting infant health. The Office of the Assistant Secretary for Health is currently planning a major public information campaign to promote healthy behavior surrounding pregnancy.[7] The campaign is designed to support and reinforce ongoing activities and to help women evaluate and set priorities about what actions they might take to limit their own risks.

Both the National Institute on Alcohol Abuse and Alcoholism and the Office of Smoking and Health will play major roles in this information program. Overall campaign objectives are: (a) to provide information promoting healthy behavior to pregnant women and to women planning a pregnancy; (b) to increase their awareness and understanding of relative health risks and personal responsibility for their health and the health of their infants; and (c) to motivate these women to take action to protect their health, and to seek counsel/assistance when needed.

Some messages developed as part of this media event will be directed at all pregnant women; however, special emphasis will be given to groups at high risk: women with a known medical risk, women in lower socio-economic groups, and pregnant teenagers. Supplementary efforts will be designed to reach women planning pregnancy, health care professionals, spouses and concerned others, and health teachers and school nurses. Among the messages to be transmitted via television, radio, and professional and lay print media are the following: nutrition during pregnancy; use of alcohol, drugs and caffeine; nutrition of infants and breast feeding; physical activity; and exercise; cigarette smoking; signs of abnormal pregnancy; importance of regular pre-natal care; preparation for labor and delivery and preperation for the care of the infant.

4. Nutrition Education Research

Since 1977 Federal support for nutrition education research has increased. The Office of Science and Technology Policy (OSTP), Executive Office of the President, will soon be releasing an update for the 1980s on nutrition education research, titled **III. Nutrition Education Research and Professional Personnel Needs for Nutrition Education of Professionals and the Public.** The report addresses the need to develop programs in the nutrition education of professionals, and expand the programs in nutrition education research and in nutrition education and information of the public to make a maximal contribution to improving the quality of life. In the report nutrition education research is described as (a) studies of the determinants of dietary practices and of food consumption practices, (b) research to develop strategies for informing the public about food, nutrition, health, and dietary practices; and (c) research to evaluate nutrition education programs as well as on methods to undertake such research. Two other reports prepared by the Joint Subcommittee on Human Nutrition Research of OSTP have addressed federally-supported human nutrition research and training,[8] and international nutrition.

5. The Block Grants Funding Mechanism

On August 13 the President signed into law sweeping new legislation aimed at reducing the high cost of federal government — the block grant funding of programs versus categorial grant programs. Some 26 separate DHHS spending programs were folded into the following seven block grants: preventive health; maternal and child health; alcohol, drug abuse and mental health; primary care; social services; community services; and energy assistance. The legislative goals for these block grants offer the potential for the delivery of nutrition and other preventative services, along with research and training grants funds targeted at helping people reduce their health risks.

Professional organizations are working with their memberships to prepare them to play an active leadership role in assisting State and local governments in the implementation of block grants for health services, research and training.[9] There are opportunities for participation and leadership in assessing the nutrition and health needs, planning and implementing nutrition and other health services for the American public.

CONCLUSION

In conclusion, it seems fitting to share with you a challenging statement that Secretary Schweiker made recently before a DHHS conference on the assessment of nutrition: "One of our biggest challenges is to persuade Americans to adopt prevention into their daily lives . . . to help them take control over their own health destiny by taking steps that stop disease **before** it starts." In today's world, this kind of thinking is most appropriate at a national conference addressing nutrition education in health professions schools. It will take active leadership on the part of each of us as individuals and as members of professional societies to insure that our medical and other health care personnel are adequately prepared to incorporate sound nutrition principles into health care services . . . and ultimately meet that challenge statement of the Secretary. The momentum for nutrition in this decade has begun and I am optimistic about the direction for nutrition in the 1980s.

1. During the fiscal years 1979 and 1980 the Division of Association Health Professionals in the Bureau of Health Manpower of the Health Resources Administration in the DHHS Public Health Service administered the funding under section 788(d) of the Public Health Service Act.
2. *Nutrition and Your Health: Dietary Guidelines for Americans.* Available from Consumer Information Center, Department 656H, Pueblo, Colorado 81009 Single copy free.
3. *Healthy People: The Surgeon General's Report on Health Promotion and Disease Prevention,* July 1979. Available from the Government Printing Office. — Stock No. 017-001-00416-2 $5 per copy.
4. *Promoting Health/Preventing Disease: Objectives for the Nation* Fall 1980. Available from the Government Printing Office. — Stock No. 017-001-0043[illegible]-9 $4.50 per copy.
5. Nutritional Assessment Conference, September 16-18, 1981. NIH Campus, Bethesda, Maryland.
6. "Joint Implementation Plan for A Comprehensive National Nutrition Monitoring System" DHHS-USDA. October 2, 1981.
7. For additional information write to "Healthy Mother's" Public Information Program. National Health Information Clearinghouse (NHICH), P.O. Box 1133, Washington, D.C. 20013.
8. *Federally-Supported Human Nutrition Research, Training, and Education: Update for the 1980s. I. Human Nutrition Research and Training.* December 5, 1980. JSHNR. OSTP.
9. Society for Nutrition Education, 2140 Shattuck Avenue, Suite 1110, Berkeley, California 94704.

ISSUES IN MEDICAL EDUCATION

James F. Glenn, M.D.

Ladies and gentlemen, I sincerely appreciate the opportunity to be with you today. I bring you greetings from the Trustees of Emory University, the appreciation of President James T. Laney for your efforts in holding this conference, and the congratulations of Dr. E. Garland Herndon, Jr., Vice President for Health Affairs at Emory, for the substance of this outstanding workshop.

We at Emory University School of Medicine have great hope that this workshop will culminate in a definitive statement of the need for nutrition education in our medical and paramedical curricula. A workshop is a learning experience, and indeed all of us at Emory as sponsors of this conference are here as learners, not teachers. We anticipate that your collective wisdom may be collated in a final statement which will aid us as we refine the educational process as it relates to nutrition.

I have learned much from you already. The very structure of your outstanding program gives credence to the need for nutrition education. In reveiwing the statement of objectives and purposes of this workshop, one reaches the inescapable conclusion that medical education in the realm of nutrition has been neglected in the past and must be emphasized in the future. The definition of issues to be discussed in this workshop has been clear and precise, amplifying the need for nutrition education. Perhaps most rewarding for me has been the opportunity to review our own programs, projects, progress and prospects in nutrition at Emory. It is clear that we — along with many medical schools across the nation — have the nucleus of expertise in various areas of nutrition, but that these need to be consolidated and coordinated to provide the necessary educational impact, both in the Medical School curriculum and the curricula of the other health professions.

As this workshop proceeds, I sense a certain frustration on the part of the participants, frustration that we are not making and have not made the progress necessary in nutrition education. My response to this is simply one of reassurance: truly, things seem to move slowly, but we should take comfort in the definitive progress that has been made. We must remember that it was only within this century that the vitamin deficiency diseases were scientifically defined, but that already we can say that pellagra, scurvy and rickets are diseases which are understood on a nutritional basis and are rapidly being eradicated from society. Remember as well that it is only within the last 30 years that we have come to understand the nutritional aspects of surgical practice; Dr. Francis D. Moore of Harvard and the Peter Bent Brigham Hospital brought us into the modern era of surgery with his textbook, "The Metabolic Basis of Surgical Practice."

It has been said that learning is a painful experience, and indeed we have been painfully so aware in learning certain nutritional lesson as they relate to medical practice. In example, it was in the 1930's that Dr. Walter Kempner of Duke University developed and introduced the rice diet as a measure for control of hypertension and amelioration of impending renal failure, whether secondary to hypertensive vascular disease, diabetes, or any one of a number of causes of nephropathy. The diet was eminently successful in an era when other medical measures were lacking, and the diet has persisted as an outstanding modality of weight control over the years. Unfortunately, the diet is based in part upon the restriction of fluids and proteins; water deprivation has been incriminated as the cause of renal calculi in a number of patients, and protein deficiency may impair wound healing in the post-surgical patient. Fortunately, we now recognize these potential problems.

I would remind you also that we as physicians have now come to understand the need for nutritional balance in many disease states, medical and surgical. Parenteral hyperalimentation had its advent only within the past decade. Newer techniques of postoperative enteric feeding are only now being introduced. The relationship of nutrition to the successful chemotherapy of malignant diseases is only now being explored. There are many exciting prospects on the horizon, and we must take solace that our progress is continuing.

I must bring a word of caution to this workshop. While it is desirable that we integrate nutrition education into the curriculum, there are many demands for curriculum time. The explosion of medical knowledge the past three or four decades has accentuated the demand upon the student's time. We currently have a task force at work at Emory to review and revise our curriculum. The need for nutrition education is clear, but as a urologic surgeon, I would also point out that urology is not a required course in most medical schools, though approximately 10% of all hospital admissions across this nation are for urologic diseases and disorders. Clearly, one can make a strong case for requiring formal education in urology in all medical schools, perhaps demanding 10% of clinical teaching time. Since nutrition affects 100% of our patients, perhaps we might be so bold to suggest that nutrition education must occupy the most prominent position in the curriculum!

Further, I can foresee problems relating to the structure of any nutrition education program in the health professions. Should nutrition more properly be taught within the context of physiology, biochemistry or the other basic biomedical sciences? Should nutrition have departmental status in our medical schools and hence command a significant segment of curriculum time? Can the committee approach be employed successfully, bringing together individuals of many disciplines who will teach fragments of nutrition to our students? Or must we address the issue by identifying a specific block of curriculum time for nutrition, offering this education as a "center" concept?

Finally, I would offer some broader comments which may help us to sharpen our perception of the financial implications of nutrition education. It seems clear that most medical schools will not be able to improve education in nutrition without some additional external support. The very mention of this financial need makes it necessary that we realize that medicine, medical education, and health care have all increased in public cost. Before World War II, the several components of health care amounted to only about 4% of the gross national product. During the 1950's and the 1960's this figure rose to 8% of the GNP, and today the many components of medical care account for 13% of our GNP. It has been estimated that by 1990, some 20% of the GNP will be reflected in medical care.

This is undoubtedly due to the fact that health care is a labor-intensive area, accentuated by the high cost of medical education. At the national average, it now costs well over $20,000 per student per year to provide education, and in private institutions such as Emory the cost may be substantially higher than this average. At the same time, we recognize that we may be producing too many health professionals; the Graduate Medical Education National Advisory Committee, (GMENAC) has projected an oversupply of virtually all types of physicians by 1990, challenging the medical profession and medical educators to modulate production to meet anticipated demand.

Despite negative societal and financial pressures, I remain confident in the future and optimistic about the innovations which will be made during these two decades which will usher us into the next century of health care. Nutrition education will remain important and should become prominent as one significant measure in the prevention of disease and maintenance of health. I have every confidence that new skills in nutrition and in nutrition education will be introduced, and that the participants in this workshop and colleagues throughout the nation will be the innovators to provide the necessary leadership.

REFLECTIONS ON THE ISSUES AND WORKSHOP SUMMARY

Polly A. Fitz, M.A., R.D.

We need to start with why we came. We all have our own agendas, but the conference planners were very clear with us about what they hope to accomplish. Therefore, I wish to remind you of the purposes of this workshop:

1. To provide a national forum for the sharing of promising nutrition education practices in health professional schools.
2. To identify the major issues confronting nutrition education in the health professions.

Although in the main we have focused on medical school education, in my experiences at the conference we have achieved those purposes. It is nice to have this opportunity to reflect my own opinion based on all the wonderful presentations we have heard. The futurists assure us that in viewing tomorrow that we can only view the world from the point of view of alternative futures . . . there is no longer any assurance of one future or of one world . . . and it is my sense that today we are considering a number of alternatives for ourselves and our individual programs. The perspective of today was presented by the "talent bank" present in the room and by our superb colleagues who shared their expert points of view. They shared new, and reinforced, facts and they shared their experiences in the provision of nutrition education; thus, providing a basis for viewing the tomorrows for all of us, one of the logical next steps. I see our mission as improving nutrition education in medical schools and I would expand that to all health professions schools, as evidenced by my personal bias.

As always, in reviewing anything I believe a review of the past is an important dimension for future planning. Therefore, I will provide a review or summary of the past two days as preparation for the next steps in implementing more effective nutrition education in medical schools.

Our exploration of ideas and concepts has ranged from an examination of the philosophical base for belief systems, which are the foundation for nutrition education in medical schools, to the evaluation of our efforts with students and the look at our mission with the larger public we serve as health professionals.

Dr. Young began with a complete list of factors in the development of nutrition programs. Her talk contained steps that are familiar but important to us. The discussions as we progressed in the workshop reinforced our experiences with the need for:

1. a variety of educational approaches
2. clinical relevance and application
3. clearly defined content

but also needing to deal with the politics of curriculum development. Some of the politics are obvious. They involve recognition, visibility, seeking resources of time and money, and seeking the leader. Who is the leader — in our institutions, in our communities and with the public policy makers? Who are our leaders in nutrition education? And I think we identified many leaders, at least as I heard them reflected in the discussions.

Dr. Weinsier initiated our discussions of specific experiences in implementing nutrition education programs in medical schools.

He offers some excellent competition in our impressions of Alabama. My impression prior to meeting him was that Bear Bryant was really the University of Alabama. I have now met some competition for Mr. Bryant.

Nutrition at Alabama has a two platoon approach: support in the institution and a fine record of wins in the education strategy and research departments.

The sharing of our experiences and strategies in the small groups led to further generation of ideas and approaches. Most important, we learned of the commonalities of our experiences, initiating where possible, shopping for faculty resources, working with motivated students, placement in the curriculum in basic and applied areas. These commonalities *demonstrate the developing nature of our programs,* and like developing nations, status, power, the ever complex world are issues that demand energy and attention.

Dr. Baumslag, in addition to describing the experience at Emory, further challenged our thinking by: asking us to consider what is necessary to out-reach into the community in defining the role of nutrition in prevention, asking us to examine the gaps in physician education; and, asking us to build the case for why the physician has a role in nutrition, beginning with his/her own nutrition practices.

We came back to Dr. Baumslag's questions in our small groups and again the descriptions of what people and programs are deliberating demonstrates a high level of activity for a relatively small resource in our nutrition program. This small resource but high level of activity, suggests that increased visibility of our efforts bears attention. The "hype" of the media may bear examination in taking small, but significant efforts to the institutional and public eye.

Dr. Montandon addressed the team as defined in the Williamsburg Conference and introduced the team as another point of view. There the team was defined as the clinician, the basic scientist, and the dietitian. Her description of the Texas study points up strategic questions: Where is priority for nutrition counseling — not in our traditional view, perhaps, but in the long term, on-going and sustained work with our clients and patients? Also, how do we utilize the resources on a team in a cost-effective manner?

In small groups it became clear that we may not agree on the team concept — but that we agree on the need for expanded resources in delivery of education and services for such an integrated area as nutrition.

Dr. White's review of the London Symposium and the American Medical Association surveys was helpful in our developing framework for the outcomes of the conference. His emphasis on **quality** in teaching nutrition and the requisite expertise which I thought he spelled out quite clearly, and requisite special services was an important dimension to our ensuing discussions.

Dr. White also surfaced a critical perspective, which I think we all need to come back to in our curriculum development. Physician education should be viewed as a **continuum of learning.** He asked us to remember that the graduating student is not a finished product . . . internships, residencies and continuing education are further opportunities for nutrition education programs. His description of nutrition as a public policy issue conjours up further thoughts on opportunities as well as work we must do.

The adminstrator appears — that being Dr. Glenn . . . Dean, Emory University School of Medicine. Administrators as I experience them are usually good targets for all program development and ideas. We are seen as the source of power and really making the decisions. I thought that Dr. Glenn presented a challenge to us in terms of highlighting the diffuse nature of our nutrition subject. That was his point of view and I think many of us echoed that in our discussions. He commented on how Emory is working on looking for the answers in nutrition curriculum — where is nutrition's place. He said it is easy to mount a program under a single department, but difficult to mount a program of a multidisciplinary nature. This again surfaced in our many group discussions.

Dr. Glenn's point regarding health as a public policy issue, enlarged our world to look at a total environment, and that is a complex world because we have to relate to things like GNP as well as peoples' needs and diminishing resources. That influences all of us.

Dr. Olson presented much good information in his review of the dietary allowances. His bias is that nutrition will not gain medical students' attention if buried in other subjects. This was also the opinion of some group members in the discussion sessions. A committee is one device for focusing on interdisciplinary problems. The problem with nutrition is that it is beset with emotions, politics and mythology.

Dr. Olson reviewed actions of the Food and Nutrition Board as a model for how scientific information is verified. The sources of information in setting recommended dietary allowances are legitimate: epidemiologic studies, clinical medicine, clinical investigation, clinical traials, and animal studies. RDA's are for planning diets for the population, not as a bases for clinical evaluation of the individual client.

One way to separate fact from fiction is for health care professionals to be role models for our preventive medicine concepts. Another is to use standard scientific criteria for evaluating information as Dr. Olson demonstrated in his review of how the RDA's are established. I liked his quote from Jarvis who said, "We all filter facts through our belief structure."

The panel of project directors provided us with an array of talent and experience from which they could provide guidance concerning the management of the nutrition curriculum. Because third year funding is not available, these projects will never be evaluated.

Dr. Nestle, the panel chairperson, from the Univeristy of California, San Francisco, spoke in favor of student committees to support nutrition integration in the curriculum

Dr. Levy discussed the perceived benefits of the nutrition project at the Medical College of Georgia: increased visibility, involvement of other schools, computer program packages to teach nutrition concepts, and the nutrition newsletter. Definitely, an increased investment in nutrition has been demonstrated.

Dr. Beaubien discussed a unique six year curriculum at Youngstown State University in Ohio. It is a B.S./M.D. curriculum. Therefore, nutrition education can start earlier and occur in three levels: basic sciences, pre-clinical and clinical years.

Dr. Bateman's project at Montifiore Hospital in New York targets house officers rather than medical students. They have found it to be an effective time to teach nutrition. Based on their experiences he recommends that nutrition be **integrated** into the curriculum; also nutrition should be required for other professionals. Resources for nutrition education should be expanded. Nutrition intervention teams — nurse, nutritionist, and pediatrician — have been utilized and proven effective in their hospital care.

Dr. Bowermaster, from the University of Illinois Medical School in Urbana, outlined these principles for a nutrition education program:

1. Treat all disciplines as equal partners

2. Learn what the others do
3. Communicate openly
4. Involve both didactic and clinical faculty
5. Use protocols for care that include nutrition
6. Use instructional materials that focus on nutrition

Dr. Gabel presented a model for education evaluation. He, thus, reminds us of the importance of planning and assessment issues and that evaluation is a decision enabling process. Certainly, effective planning helps!!! We are like the new kid on the block . . . we need to be better at our fight for recognition, and we have to be first. Good planning does insure effective implementation so his comments around planning should be very helpful.

Dr. Sylvia Fields discussed interprofessional collaboration issues. She organized the many biases we all have about regarding working collaboratively into a scholarly perspective. Collaboration can be a source of power if used knowledgeably.

Dr. Moragne brought us back again to the issue of public policy. She told us about Secretary Schweiker's adoption of the **Dietary Goals** and the role of the Federal government in the nutrition of the nation. Implementing the **Goals** will require collaboration of many professional groups. Again our attention is drawn to key policy issues! According to Dr. Moragne, leaderhsip will be the requisite for the 80's as far as nutrition and prevention are concerned.

My impressions in leaving

1. We have curriculum models as evidenced by the presentations and the discussion in the small groups. There are many to choose from.
2. We have the varied and many solutions in our institutions which respond to problems we have discussed.
3. We have talent as evidenced by persons I have met here to offer leadership and solutions to the problems.
4. We have an emerging subject and service in nutrition that has increasing importance with our public.
5. We have ideas and services that are marketable.
6. We have clients and a public with needs for more solutions to their nutritional problems — wonderful opportunities.
7. We have a superb resource in the students that we all work with. They are the real promise for alternative futures.

Hopefully, one day, I will read about the 80's and the advances in nutrition. I believe this conference and the participants here will author that history.

EXHIBITS

EXHIBITOR: Arco Publishing Company

CONTACT INDIVIDUALS:
Mike Levine or Richard Frishman
Planned Television Arts LTD
25 West 43rd Street
New York, New York 10036

DESCRIPTION OF EXHIBIT: The book titled, *Diabetes: A Practical Guide to Healthy Living* by James W. Anderson, M.D., was displayed.

EXHIBITOR: C. V. Mosby Company

CONTACT INDIVIDUAL:
John Genoa
730 S. Wolfe Street
Baltimore, Maryland 21231

DESCRIPTION OF EXHIBIT: Current books on nutrition and nutrition related topics were displayed. Also available at the exhibit were order forms and catalogs listing additional books published by C. V. Mosby Company.

EXHIBITOR: Emory University School of Medicine

CONTACT INDIVIDUAL:
Donna R. Watson, M.S., R.D.
Glenn Building
69 Butler Street
Atlanta, Georgia 30303

DESCRIPTION OF EXHIBIT: The following materals were displayed:

Slide tape series on Nutritional Assessment

Study Guides to accompany slide tapes series

1. The Medical History
2. The Physical Examination
3. The Diet History
4. Biochemical/Laboratory
5. Anthropometric Measurements

Proceedings of the Curriculum Development in Applied Nutrition Conference (Sept. 7,8,9, 1980)

Analysis of the nutrition curriculum in the medical school and nursing school

Survey of Nutrition Competencies for Five Health Professions

Nutrition Resource Guide

EXHIBITOR: J. B. Lippincott Company and Harper and Row

CONTACT INDIVIDUALS:
Ray Ruhman or Richard Cordrey
East Washington Square, P. O. Box 1430
Philadelphia, Pennsylvania 19105

DESCRIPTION OF EXHIBIT: Current books on nutrition and nutrition related topics were displayed. Also available were order forms and pamphlets listing the books and brief descriptions of the subject content contained in each.

EXHIBITOR: John Wiley and Sons

CONTACT INDIVIDUAL:
Jackie Philpotts
605 3rd Avenue
New York, New York 10158

DESCRIPTION OF EXHIBIT: Current books on nutrition and nutrition related topics were displayed.

EXHIBITOR: Medical College of Georgia

CONTACT INDIVIDUAL:
Maurice Levy, Ed.D.
Department of Medicine
1120 Fifteenth Street
Augusta, Georgia 30901

DESCRIPTION OF EXHIBIT: Displayed on posterboards and in pamphlets and notebooks were the following materials:

Description of computer-assisted instruction

Listing of topics and lecturers at the "Distinguished Lecture Series in Nutrition"

Description of interdisciplinary nutrition elective

Newsletters ("Food for Thought")

Guidelines for interdisciplinary team training in nutrition

Information from the "Frontiers in Nutrition" Conference (September 17-19, 1981)

EXHIBITOR: Montefiore Hospital and Medical Center

CONTACT INDIVIDUAL:
William B. Bateman, Jr., M.D.
Residency Program in Social Medicine
Montefiore Hospital and Medical Center
111 East 210th Street
Bronx, New York 10467

DESCRIPTION OF EXHIBIT: Posters illustrated the evolution of a developing curriculum over a three year period with objectives for the program. A list of learning objectives for nursing students was also included. A set of self study guides on the following topics was displayed:

Vegetarianism

Nutrition for Beikost to Age Four

Nutrition for Four Years Old through Adolescence

EXHIBITOR: (1) Ohio Regional Medical Audiovisual Consortium

CONTACT INDIVIDUAL:
James Battles, Ph.D.
110 Hamilton Hall
1645 Neil Avenue
Columbus, Ohio 43210

(2) Ross Laboratories

CONTACT INDIVIDUAL:
Maria Steinbaugh, Ph.D., R.D.
Nutritional Services
625 Cleveland Avenue
Columbus, Ohio 43216

(3) Abbott Laboratories
Hospital Products Division
North Chicago, Illinois 60064

DESCRIPTION OF EXHIBIT: A sophisticated exhibit illustrating a series of instructional materials in human nutrition titled "Human Nutrition" was displayed. The programs which make up the series were shown on a videocassette and were as follows:

"Basic metabolic Processes"
"Nutrient Needs-Protein and Calories"
"Nutrient Needs-Fatty Acids and Vitamins"
"Nutrient Needs-Water and Minerals"
"Malnutrition: Diagnosis and Therapeutic Alternatives"

EXHIBITORS: Ohio State University

CONTACT INDIVIDUAL:
Lawrence L. Gabel, Ph.D.
Nutrition in Primary Care
Department of Family Medicine
456 Clinic Drive
Columbus, Ohio 43210

DESCRIPTION OF EXHIBIT: The "Nutrition in Primary Care Series" was displayed with features of the series illustrated on posterboards. Display copies of the sixteen 45 minute self-study modules for practitioners and students of medicine, nursing, and allied health areas were available for review.

EXHIBITOR: Society for Nutrition Education
2140 Shattuck Ave., Suite 1110
Berkeley, California 94704

DESCRIPTION OF EXHIBIT: A film was shown titled "Nutritional Managment of High-Risk Pregnancy". Included at the exhibit were study guides to accompany the film and order forms for the film and study guides.

EXHIBITOR: University of California
School of Medicine

CONTACT INDIVIDUAL:
Marion Nestle, Ph.D.
513 Parnassus Avenue
San Francisco, California 94143

DESCRIPTION OF EXHIBIT: On display were two booklets produced by the project:

1. Nutrition in Family Medicine: A Resource Guide for the Clnical Setting.
2. Nutrition UCSF: A Resource Guide to Courses, Services, and Research.

Identified on the posters were:

1. Instructional products in nutrition produced by UCSF faculty and staff
2. Nutrition courses and major lecture series offered at UCSF
3. Goals of the nutrition program

EXHIBITOR: University of Illinois
School of Clinical Medicine
College of Nursing
College of Associated Health Professions
Clinical Dietetics

CONTACT INDIVIDUAL:
Willard J. Visek, M.D.
Project Director
190 Medical Sciences Building
University of Illinois
Urbana, Illinois 61801

DESCRIPTION OF EXHIBIT: The three piece poster board was titled "Innovations in Applied Clinical Nutrition". Included in the display describing the three year project were:

Integrated curriculum

Instructional design by interdisciplinary teams

Apple computer with display screen, disks, printer Included also in the exhibit was a tutorial series based on the problem solving case study approach.

EXHIBITOR: University of Pennsylvania School of Medicine
Department of Surgery and Clinical Nutrition Center

CONTACT INDIVIDUAL:

Wanda F. Hain, M.Ed., R.D.

Nutrition Education Specialist

Hospital of the University of Pennsylvania

4500 Spruce St., Box 524

Philadelphia, Pennsylvania 19104

DESCRIPTION OF EXHIBIT: The following materials were displayed:

Syllabi from the course "Clinical Nutrition in an Interdisciplinary Setting" taught May 1980 and May 1981.

Evaluation course reports of "Clinical Nutrition in an Interdisciplinary Setting" taught May 1980 and May 1981.

Audiovisual scripts for audiovisual modules which include videotape and slidetapes.

Project related publications, presentations, and abstracts for the period January 1980 through September 1981.

EXHIBITOR: University of Utah College of Medicine

CONTACT INDIVIDUALS:
Malcolm M. Berenson, M.D.
Rita Thomas, Ph.D., R.D.
Division of Gastroenterology
50 North Medical Drive
Salt Lake City, Utah 84132

DESCRIPTION OF EXHIBIT: On display was a copy of a nutrition course syllabus as well as a set of notebooks containing lectures and slide sets on the following topics:

Nutritional Implications in Allergic Disorders

Overview of Renal Disease

Osteoporosis

Total Parenteral Nutrition Formulations

Aseptic Technique in the Preparation of Solutions for Total Parenteral Nutrition

Nutrition and Drugs

EXHIBITOR: W. B. Saunders Company

CONTACT INDIVIDUAL:
John Gervase
911 Schindler Drive
Silver Springs, Maryland 20903

DESCRIPTION OF EXHIBIT: A large number of books on nutrition and various other areas of medicine were displayed.

EXHIBITOR: Youngstown State University Ohio

CONTACT INDIVIDUAL:
Mary J. Beubian, Ph.D., R.D.
Home Economics Department
Youngstown State University
410 Wick Avenue
Youngstown, Ohio 44555

DESCRIPTION OF EXHIBIT: Posterboards containing pictures, illustrated various nutrition related activities at Youngstown State University (Multi-institutional Health Training Complex in Northeastern Ohio). A description of an interdisciplinary curriculum in applied nutrition was displayed as well as self-instructional modules on the following topics:

Nutritional Management of Neurovascular Disease

Nutritional Support of Patients with Thermal Injuries

Assessment of Nutrition During Pregnancy, Lactation, and Infant Feeding

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